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UNDERSTANDING THE STAGE 2 DISINFECTANTS AND DISINFECTION BY-PRODUCTS RULE – WHAT ARMY INSTALLATIONS NEED TO KNOW

Water Supply Management
Information Paper №. IP 31-043

EXECUTIVE SUMMARY

1. PURPOSE. This information paper provides guidance to address the recently promulgated Stage 2 Disinfectants and Disinfection By-Products Rule (Stage 2 DBPR). This information paper also includes actions that Army water systems may need to take to ensure rule compliance and continued public health protection.

2. IMPACT ON ARMY WATER SYSTEMS.

a. Affected Army Water Systems. The Stage 2 DBPR will provide additional, more equitable health protection from disinfection by-products (DBPs). The rule applies to Public Water Systems (PWSs) classified as Community or Non-Transient Non-Community water systems (NTNCWSs) that add a primary or residual disinfectant other than ultraviolet (UV) light or deliver water that has been treated with a primary or residual disinfectant (other than UV light) must comply with the Stage 2 DBPR. Because Army regulations require Army water systems to disinfect water supplies, the Stage 2 DBPR will affect many U.S. Army water systems. Overseas Army water systems are expected to comply with the Stage 2 DBPR in the future, upon revision of the Overseas Environmental Baseline Guidance Document. Most U.S. Army water systems purchasing their water will not likely have to comply with the Stage 2 DBPR since the majority of these systems are not subject to the National Primary Drinking Water Regulations (NPDWRs). However, some States may require their purchasing systems to comply with this rule. The compliance timeline provided on page 5 of this information paper shows the Stage 2 DBPR and Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) compliance deadlines for major rule provisions for water systems of various sizes. Because disinfection and microbial pathogen control directly affect each other, these two rules are promulgated simultaneously to help water systems deliver safer water ensuring the benefits of disinfection for controlling pathogens and reducing risks from DBP).

b. Stage 2 DBPR Provisions.

(1) Initial Distribution System Evaluation (IDSE). The IDSE is the first provision that affected water systems must comply with under the Stage 2 DBPR. It is also the most complex provision. The IDSE is a multi-year provision that will require Army water systems to prepare and submit an IDSE plan, and conduct IDSE monitoring to identify new Stage 2 DBPR compliance monitoring sites. The IDSE will also identify if an Army water system must modify or change its treatment or operational practices to comply with the future Stage 2 total

trihalomethane (TTHM) and five haloacetic acid (HAA5) maximum contaminant levels (MCLs). There are several options available to affected water systems for complying with the IDSE provision. Most affected Army water systems are expected to pursue the IDSE Standard Monitoring (SM) option incurring laboratory costs ranging from $10,000 - $50,000 depending on their water system size. The System-Specific Study (SSS) Hydraulic Model option for the IDSE provision is more expensive but can provide additional benefits for water system security and master planning. Because the IDSE provision is a multi-year provision, affected Army water systems must ensure funds are programmed and available for the duration of the IDSE. The flowcharts provided in Appendix C are a useful tool that will help installation environmental and public works personnel to determine the applicability of the Stage 2 DBPR to their water system. Additionally the flowcharts will identify the major rule provisions and associated compliance deadlines specific to their installation. The Table shows the compliance deadlines the for IDSE rule provision.

(2) Determining Compliance. The Stage 2 TTHM and HAA5 MCLs are the same as the current Stage 1 TTHM 0.080 mg/L and HAA5 0.060 mg/L MCLs, but the significant difference is how compliance with these MCLs is calculated. Under the Stage 1 DBPR, compliance is calculated as a distribution system-wide running annual average (RAA). Under the Stage 2 DBPR, compliance is calculated at each monitoring location [i.e., a locational running annual average (LRAA)]. Therefore, the likelihood of systems being in noncompliance with DBP standards may increase under the Stage 2 DBPR. The Table shows the deadlines to begin compliance monitoring for determining compliance with the Stage 2 DBPR TTHM and HAA5 MCLs.

Table. Compliance Deadlines for Stage 2 DBPR Major Requirements.

Stage 2 DBPR Requirement	CWSs & NTNCWSs serving at least 100,000	CWSs & NTNCWSs serving 50,000-99,999	CWSs & NTNCWSs serving 10,000-49,999	CWSs serving <10,000	NTNCWSs serving <10,000
Submit IDSE Plan	1 October 2006	1 April 2007	1 October 2007	1 April 2008	Not applicable
Complete IDSE monitoring or study	30 September 2008	31 March 2009	30 September 2009	31 March 2010	Not applicable
Submit IDSE Report	1 January 2009	1 July 2009	1 January 2010	1 July 2010	Not applicable
Begin Compliance Monitoring	1 April 2012	1 October 2012	1 October 2013	1 October 2013[1]	

1. 1 October 2014 if *Cryptosporidium* monitoring is required under the LT2ESWTR.

c. Resources for Assistance. Due to these rule complexities, numerous resources for assistance are available to Army water systems to ensure full compliance and better, more equitable health protection for their consumers. These resources are outlined below for each step in the Stage 2 DBPR implementation.

3. ACTIONS FOR ARMY WATER SYSTEMS.

a. Determine Stage 2 DBPR Applicability. Determine if your Army water system must comply with the provisions of the Stage 2 DBPR. If you are a purchasing Army water system you should have been notified by your State if your system must comply with the Stage 2 DBPR. If you are unsure if the Stage 2 DBPR applies to your system, contact your State Stage 2 DBPR point of contact (POC) (Appendix D). Available resources:

- Section 5c, page 3
- Your State's Stage 2 DBPR POC, Appendix D
- http://www.epa.gov/safewater/disinfection/stage2/index.html
- Flowchart C-1, at the end of the executive summary (and Appendix C)

b. Determine Stage 2 DBPR Compliance Deadlines. Determine the compliance deadlines that your Army water system must meet. Available resources:

- Figure 1, page 5
- U.S. Environmental Protection Agency (EPA) Stage 2 DBPR Fact Sheet, Appendix E

c. Determine IDSE Applicability. Determine if your Army water system must comply with the IDSE provision of the Stage 2 DBPR. Available resources:

- Section 6b, page 7
- Your State's Stage 2 DBPR POC, Appendix D
- EPA IDSE Tool – http://www.epa.gov/safewater/disinfection/tools/tools-idse.html
- EPA IDSE Guidance Manuals –
- http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html
- Flowcharts C-2 and C-3, at the end of the executive summary (and Appendix C). Begin with Flowchart C-1.

d. Choose the IDSE Option to Pursue. Determine which IDSE option is right for your Army water system (SM, SSS hydraulic model or existing data, or 40/30 certification). Available resources:

- Section 6b(3), (5)-(7), pages 8-11
- Your State's Stage 2 DBPR POC, Appendix D
- EPA IDSE Tool – http://www.epa.gov/safewater/disinfection/tools/tools-idse.html

- EPA IDSE Guidance Manual –
- http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html

e. Plan Resources for Conducting the IDSE. Ensure funding is programmed and available to conduct the multi-year IDSE provision of the Stage 2 DBPR. Estimated analytical costs for Army water systems pursuing the SM option range from $10,000 - $50,000. Army water systems must plan and budget for plan development and IDSE report development. Estimated costs for Army water systems pursuing the SSS Hydraulic Modeling option will be higher than the SM option. However, additional security/emergency response, master planning, and other benefits are realized. Water systems with existing hydraulic models should consider this option.

f. Conduct the IDSE. Generally, three major requirements of the IDSE provision must be met – development and submittal of a plan or 40/30 certification to their State; completion of monitoring (SM option) or system-specific study (SSS), and preparation and submittal of the final report to their State. Available resources:

- Section 6b(4)-(7), pages 8-11
- Your State's Stage 2 DBPR POC, Appendix D
- EPA IDSE Guidance Manuals – http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html
- USACHPPM Water Supply Management Program – Phone: 410-436-3919, DSN 584-3919; http://chppm-www.apgea.army.mil/dehe/pgm31/

g. Determine Ability to Comply with Stage 2 DBPR MCLs. Determine if significant operational or treatment changes will be necessary to meet the Stage 2 DBPR TTHM and HAA5 MCLs upon completion of the IDSE. If treatment process upgrades or operational changes are required, resources should be budgeted well in advance to meet compliance deadlines. In some cases, a 2-year extension may be granted by the State for capital upgrades. Upgrades and/or operational changes should be made prior to conducting compliance monitoring to avoid MCL exceedances. Consider contracting to have an in-depth water system study conducted to evaluate compliance alternatives. Available resources:

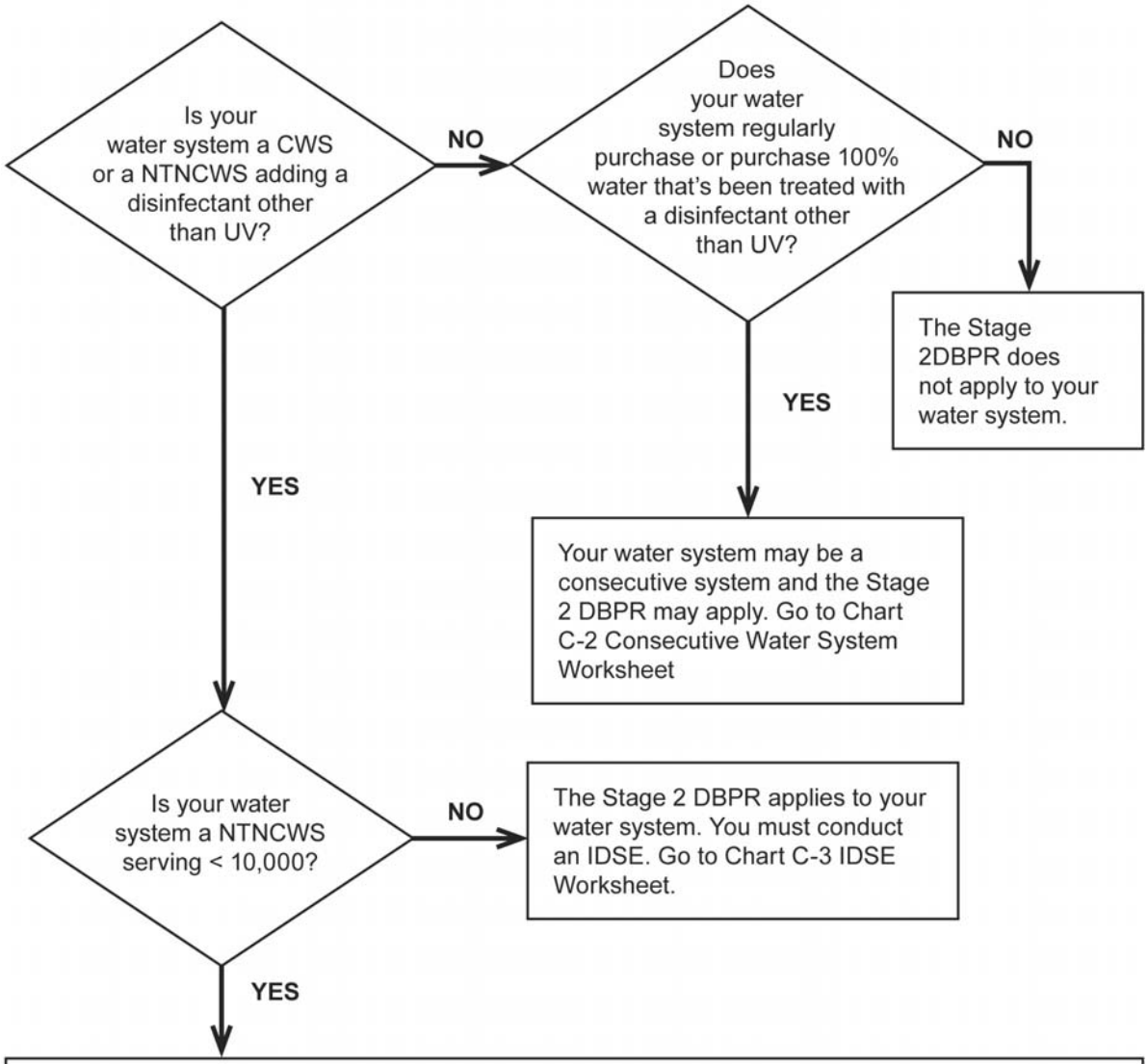
- EPA Simultaneous Compliance Guidance Manual for the Stage 2 DBPR, and LT2ESWTR. Draft available mid-2006 – http://www.epa.gov/safewater/disinfection/stage2/compliance.html
- EPA Small System Guidance Manual for the Stage 2 DBPR. Draft available mid-2006 – http://www.epa.gov/safewater/disinfection/stage2/compliance.html
- USACHPPM Water Supply Management Program – Phone: 410-436-3919, DSN 584-3919; http://chppm-www.apgea.army.mil/dehe/pgm31/
- The U.S. Army Engineering Research Laboratories, Construction & Engineering Research Laboratory for treatment technology assistance - contact Mr. Richard Scholze, phone: 217-398-5590, email: Richard.J.Scholze@erdc.usace.army.mil.

- The U.S. Army Engineer Mobile District for engineering and design assistance - contact Mr. Joseph Findley, phone: 251-694-4012, email: Joseph.W.Findley@sam.usace.army.mil.

h. Conduct Compliance Monitoring. Water systems must monitor at compliance sites identified in their IDSE. Water systems are in compliance with the TTHM and HAA5 MCLs if the annual sample (for systems sampling annually) or the LRAA (systems sampling quarterly) is less than or equal to the DBP MCLs. Available resources:

- Section 6c, pages 14-16
- EPA Small System Guidance Manual for the Stage 2 DBPR. Draft available mid-2006 – http://www.epa.gov/safewater/disinfection/stage2/compliance.html

Chart C-1
Stage 2 DBPR and IDSE Applicability Worksheet



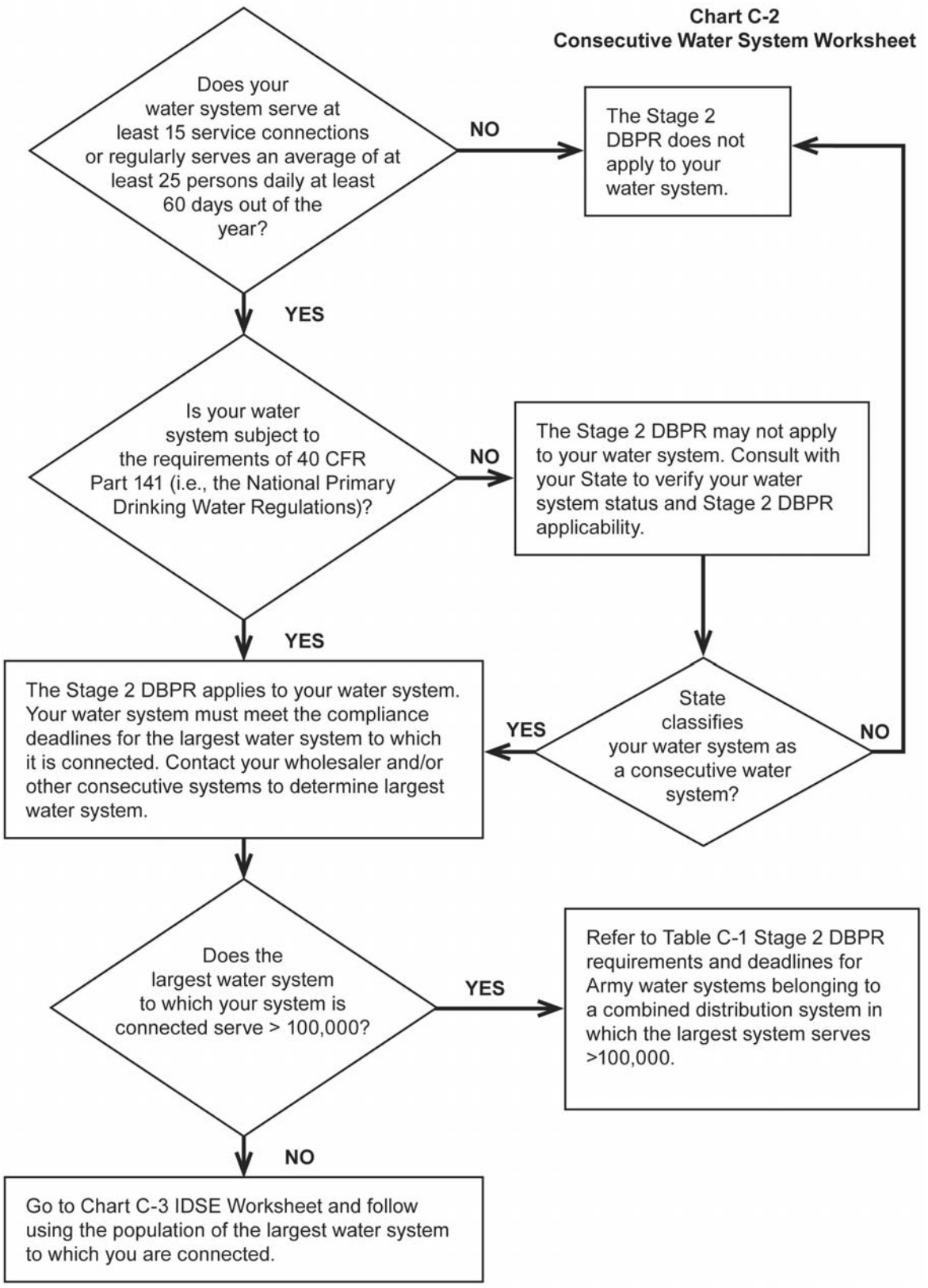
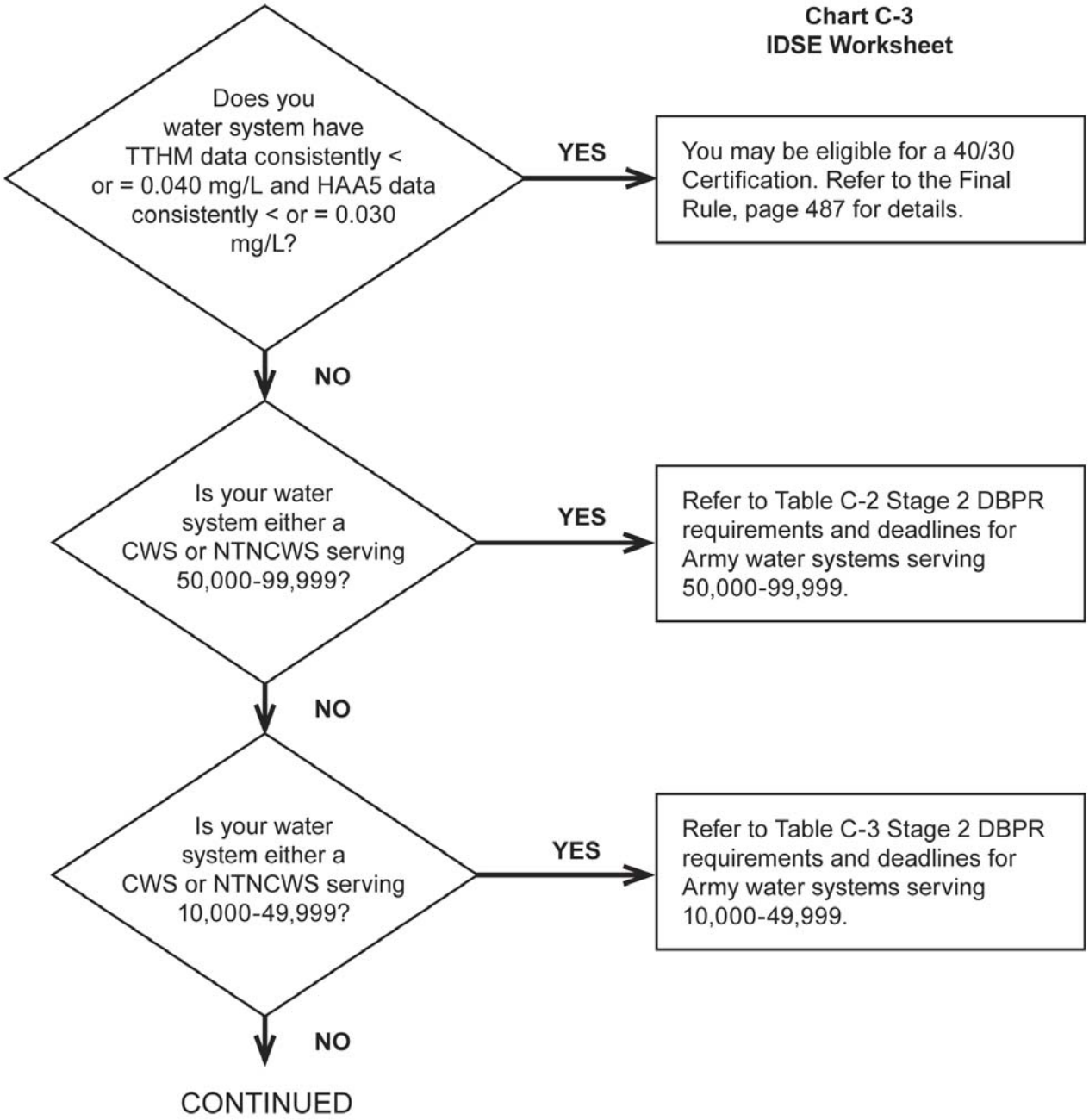


Chart C-2
Consecutive Water System Worksheet
Does your water system serve at least 15 service connections or regularly serves an average of at least 25 persons daily at least 60 days out of the year?
NO
The Stage 2 DBPR does not apply to your water system.
YES
Is your water system subject to the requirements of 40 CFR Part 141 (i.e., the National Primary Drinking Water Regulations)?
NO
The Stage 2 DBPR may not apply to your water system. Consult with your State to verify your water system status and Stage 2 DBPR applicability.
YES
The Stage 2 DBPR applies to your water system. Your water system must meet the compliance deadlines for the largest water system to which it is connected. Contact your wholesaler and/or other consecutive systems to determine largest water system.
YES
State classifies your water system as a consecutive water system?
NO
Does the largest water system to which your system is connected serve > 100,000?
YES
Refer to Table C-1 Stage 2 DBPR requirements and deadlines for Army water systems belonging to a combined distribution system in which the largest system serves >100,000.
NO
Go to Chart C-3 IDSE Worksheet and follow using the population of the largest water system to which you are connected.

Chart C-3
IDSE Worksheet



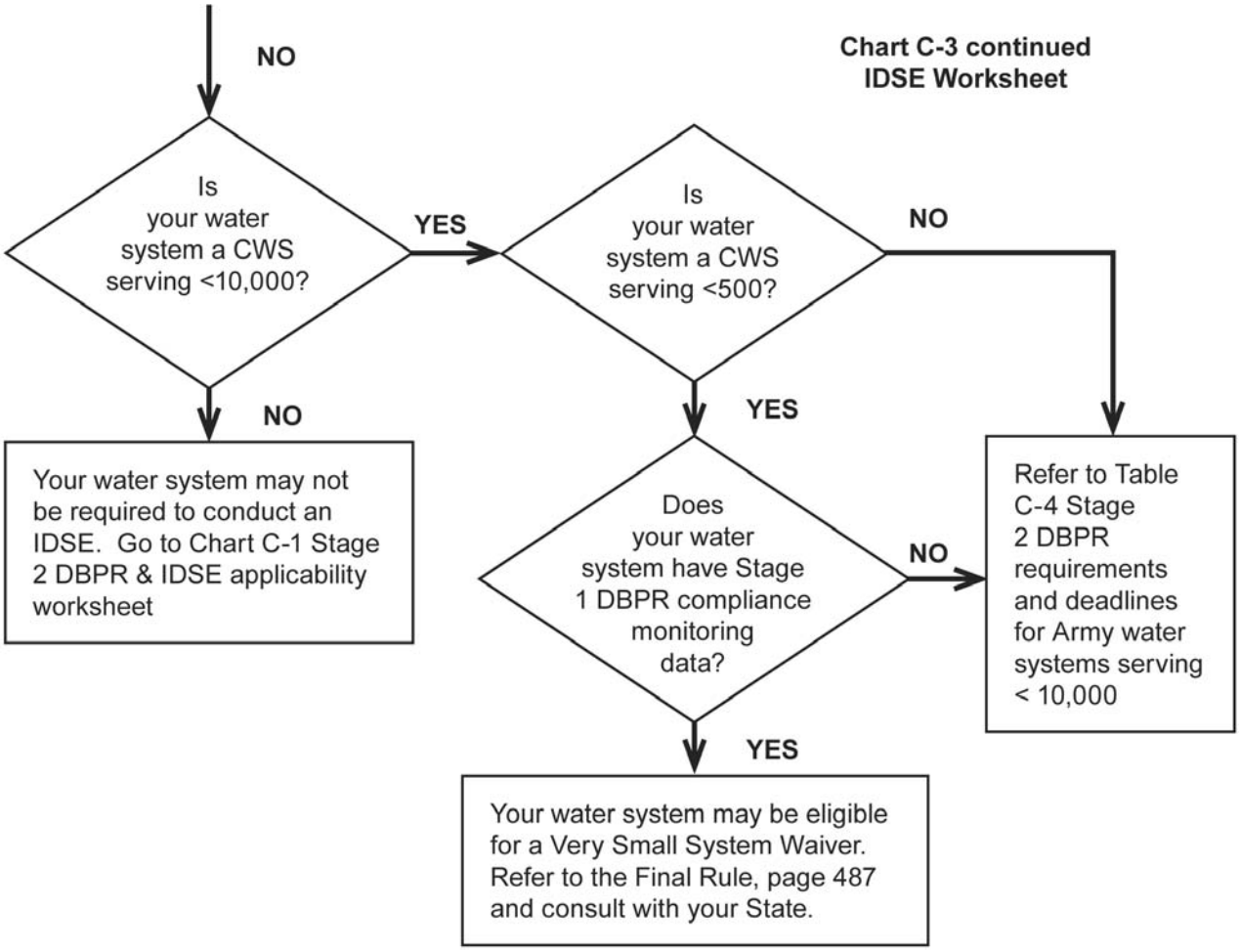


Chart C-3 continued
IDSE Worksheet
NO
Is your water system a CWS serving <10,000?
YES
Is your water system a CWS serving <500?
NO
NO
Your water system may not be required to conduct an IDSE. Go to Chart C-1 Stage 2 DBPR & IDSE applicability worksheet
YES
Does your water system have Stage 1 DBPR compliance monitoring data?
NO
Refer to Table C-4 Stage 2 DBPR requirements and deadlines for Army water systems serving < 10,000
YES
Your water system may be eligible for a Very Small System Waiver. Refer to the Final Rule, page 487 and consult with your State.

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MCHB-TS-EWS

WATER SUPPLY MANAGEMENT
INFORMATION PAPER NO. IP 31-043
UNDERSTANDING THE STAGE 2 DISINFECTANTS AND DISINFECTION BY-PRODUCTS RULE – WHAT ARMY INSTALLATIONS NEED TO KNOW

1. REFERENCES. Appendix A contains a complete list of references.

2. PURPOSE. This information paper provides guidance to address the recently promulgated Stage 2 Disinfectants and Disinfection By-Products Rule (Stage 2 DBPR). This information paper also includes actions that Army water systems may need to take to ensure rule compliance and continued public health protection.

3. DEFINITIONS AND ABBREVIATIONS. The Stage 2 DBPR and this information paper contain numerous terms that may be unfamiliar or are unique to this new rule. Definitions and abbreviations are provided in Appendix B.

4. RULE BACKGROUND.

a. History. The Safe Drinking Water Act (SDWA) is the principal law governing drinking water safety in the United States. Enacted initially in 1974 and subsequently amended, the SDWA authorizes the U.S. Environmental Protection Agency (EPA) to establish comprehensive national drinking water regulations to ensure the safety of drinking water (reference 1). One of the key aspects of the SDWA is to reduce the risk of illness due to waterborne pathogens. The disinfection process, in particular chlorination, is an extremely effective way to protect consumers from these threats. However, in the early 1970s, drinking water research showed that disinfection by-products (DBPs), in particular trihalomethanes (THMs) could be formed from the reaction of chlorine with naturally occurring organic matter. Later in the 70's, toxicological studies suggested chloroform (a THM) was carcinogenic (reference 2). To address this concern EPA promulgated a Total Trihalomethane (TTHM) Maximum Contaminant Level (MCL) of 0.10 mg/L in 1979 for Public Water Systems (PWS) serving more than 10,000 (reference 3). This regulation established the distribution system-wide Running Annual Average (RAA) concept. This was EPA's first attempt at regulating DBPs. Numerous additional health effects data suggesting DBPs might cause adverse health effects came to light after 1979. This information led Congress, in the 1996 SDWA Amendments, to require that EPA establish the Stage 1 DBPR and Stage 2 DBPR to better control DBPs. EPA promulgated the Stage 1 DBPR in 1998. The Stage 1 DBPR provides more comprehensive DBP control by applying to all Community Water Systems (CWSs) and Non-Transient Non-Community Water Systems (NTNCWs) that add a disinfectant. The Stage 1 DBPR also strengthens the existing TTHM MCL by reducing it to 0.080 mg/L and adds a new MCL of 0.060 mg/L for five haloacetic acids (HAA5) (reference 4). Additionally, the Stage 1 DBPR placed limits on how much disinfectant

could be added [Maximum Residual Disinfectant Levels – (MRDLs)], and established MCLs for other DBPs resulting from using chlorine dioxide or ozone. Even though the Stage 1 DBPR reduced the risk of adverse health effects from consuming DBPs in drinking water, more recent data on DBP exposure showed that compliance with the Stage 1 DBPR allows elevated DBP levels to regularly occur at some locations in the distribution system (reference 5). Further, DBP levels in some samples can be substantially above the Stage 1 DBPR TTHM (0.080 mg/L) and HAA5 (0.060 mg/L) MCLs, in some cases up to 75% above these MCLs (reference 5). This information, along with additional health effects data provided after the Stage 1 DBPR indicate that the Stage 2 DBPR will benefit consumers by providing better public health protection through strengthened DBP control.

b. What are DBPs? The process of disinfection results in the formation of DBPs. DBPs are formed when naturally-occurring organic and inorganic material react with a disinfectant (such as chlorine, ozone, or chlorine dioxide), added to protect consumers from microbial pathogens. The two most widely known classes of DBPs are THMs and haloacetic acids (HAAs) which occur from the reaction between chlorine and naturally occurring organic matter (NOM). These classes of DBPs typically occur at higher levels than other known and unknown DBPs (reference 5). Because of this, THMs and HAAs are considered representative of the occurrence of other DBPs and are subsequently regulated under both the Stage 1 and 2 DBPR.

c. Health Concerns of DBPs. Although the process of disinfection, in particular chlorination, has unquestionably reduced the number and extent of waterborne illness throughout the world, there are health concerns associated with DBPs formed as a result of this process. Numerous epidemiological and toxicological studies suggest DBPs in drinking water may cause cancer and adverse reproductive and developmental health effects (references 5 and 6). However, the available data does not indicate a causal link between exposure to chlorinated DBPs and cancer, and reproductive and developmental health effects. Rather, the data indicates a potential association between exposure to chlorinated DBPs and bladder cancer, and reproductive and developmental health effects (reference 5). The data also suggests a possible association between rectal and colon cancers and exposure to chlorinated DBPs. These studies, along with the DBP occurrence, data provide an indication of potential health concerns that warrant increased incremental control and support the promulgation of the Stage 2 DBPR. Ultimately, the Stage 2 DBPR will result in better public health protection.

5. UNDERSTANDING THE STAGE 2 DBPR.

a. Overview. The Stage 2 DBPR takes a risk-based compliance approach for controlling DBPs. The Stage 2 DBPR will identify a water system's DBP risk level. Those systems with the greatest risk (i.e., elevated DBP levels) will need to make operational or treatment changes to reduce the risk. This risk-based compliance approach will provide for more consistent, equitable protection from DBPs throughout an entire water system. The Stage 2 DBPR has three major provisions: 1) an Initial Distribution System Evaluation (IDSE); 2) Calculating Stage 2 DBPR MCL compliance, and 3) Operational Evaluation Levels. The IDSE identifies locations where

elevated DBP levels occur in a water system. The Stage 2 DBPR addresses DBP variations throughout a distribution system by requiring water systems to calculate a locational running annual average (LRAA) to determine DBP MCL compliance. Operational Evaluation Levels require water systems to address elevated DBP samples. These provisions will ensure more consistent, equitable DBP protection throughout a water system.

b. Rule Structure. The Stage 2 DBPR rule is contained in the Code of Federal Regulations (CFR) Part 141: National Primary Drinking Water Regulations (NPDWR) (reference 7). There are two new subparts added encompassing the Stage 2 DBPR as shown in Table 1.

Table 1. Stage 2 DBPR Rule Structure in CFR Part 141.

Subpart U – IDSE Requirement		**Subpart V – Stage 2 DBPR Requirements**	
141.600	General Requirements	141.620	General Requirements
141.601	Standard Monitoring	141.621	Routine Monitoring
141.602	System Specific Studies	141.622	Stage 2 DBPR Monitoring Plan
141.603	40/30 Certification	141.623	Reduced Monitoring
141.604	Very Small System Waivers	141.624	Additional Requirements for Consecutive Systems
141.605	Stage 2 DBPR Monitoring Location Recommendations	141.625	Conditions Requiring Increased Monitoring
		141.626	Operational Evaluation Levels
		141.627	Requirements for Remaining on Reduced TTHM and HAA5 Monitoring Based on Stage 1 DBPR Results
		141.628	Requirements for Remaining on Increased TTHM and HAA5 Monitoring Based on Stage 1 DBPR Results
		141.629	Reporting and Recordkeeping Requirements

c. Affected Water Systems.

(1) U.S. and overseas water systems. The Stage 2 DBPR applies to certain PWs located within the U.S. Specifically, PWSs classified as CWSs or NTNCWSs that add a primary or residual disinfectant other than ultraviolet (UV) light or deliver water that has been treated with a primary or residual disinfectant (other than UV light) must comply with the Stage 2 DBPR (reference 5). Because Army regulations require Army water systems to disinfect water

supplies, the Stage 2 DBPR will affect many U.S. Army water systems (reference 8). Overseas Army water systems are expected to meet the provisions of the Stage 2 DBPR in the future, upon subsequent revision of the Overseas Environmental Baseline Guidance Document (OEBGD) (reference 9). Figure C-1 in Appendix C shows a flowchart that can be used to determine the applicability of the Stage 2 DBPR to an Army water system.

(2) Consecutive water systems.

(a) The Stage 2 DBPR also applies to consecutive CWSs and NTNCWSs that receive disinfected water (excluding UV disinfected water) *and* are already subject to NPDWRs. Although a consecutive system may not currently be subject to NPDWRs, the Primacy agency (usually the State) may still require the system to comply with Stage 2 DBPR provisions. Army consecutive water systems not subject to NPDWRs should consult with their Primacy agency to verify Stage 2 DBPR applicability [see Appendix D for State points of contact (POCs)].

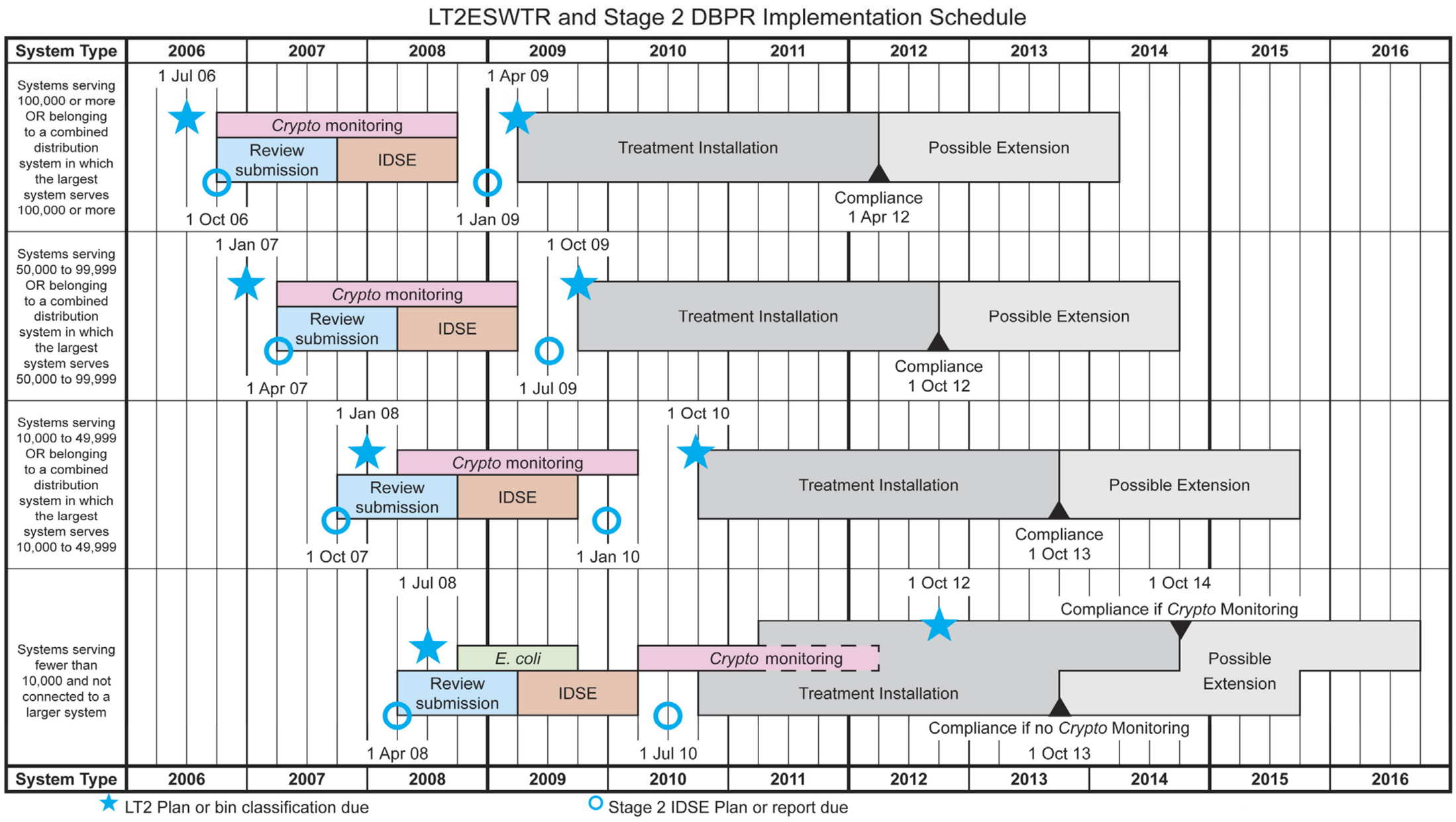
(b) A consecutive system is newly defined in the Stage 2 DBPR as a PWS that receives some or all of its finished water from one or more wholesale systems. A wholesale system is a PWS that treats source water to produce finished water and then delivers it to another PWS. A wholesale system may sell water to one or several consecutive systems. Also, consecutive systems may, in turn, sell water to another consecutive system. These interconnected distribution systems make up a Combined Distribution System (CDS). Any wholesale or consecutive water system that is part of a CDS must meet the Stage 2 DBPR compliance deadlines for the largest system in the CDS.

(c) EPA included consecutive water systems in the Stage 2 DBPR to ensure that consumers in these systems receive equivalent health protection. By regulating DBPs in consecutive systems at the federal level, EPA also provides a consistent regulatory approach for these systems. States have taken widely varying approaches to regulating DBPs in consecutive systems, and in some States, these systems are not required to comply with existing DBP standards.

(d) Under the Stage 2 DBPR, EPA is allowing States some flexibility in defining which systems are a part of a particular CDS. This provision will determine compliance dates for consecutive and wholesale systems within a CDS. As previously mentioned, each system within a CDS must meet Stage 2 DBPR compliance deadlines for the largest system in the CDS.

d. Compliance Timeline. Where applicable, compliance dates are included in the text below. Additionally, Figure 1 shows the deadlines for the major provisions of the Stage 2 DBPR. Most Army water systems will need to meet the earliest provisions of the Stage 2 DBPR (the IDSE) between 1 April 2007 and 1 April 2008. Stage 2 DBPR compliance monitoring for most Army water systems will begin between 1 October 2012 and 1 October 2013.

FIGURE 1.


LT2ESWTR and Stage 2 DBPR Implementation Schedule
System Type
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Systems serving 100,000 or more OR belonging to a combined distribution system in which the largest system serves 100,000 or more
1 Jul 06
1 Oct 06
1 Jan 09
1 Apr 09
Crypto monitoring
Review submission
IDSE
Treatment Installation
Possible Extension
Compliance 1 Apr 12
Systems serving 50,000 to 99,999 OR belonging to a combined distribution system in which the largest system serves 50,000 to 99,999
1 Jan 07
1 Apr 07
1 Jul 09
1 Oct 09
Crypto monitoring
Review submission
IDSE
Treatment Installation
Possible Extension
Compliance 1 Oct 12
Systems serving 10,000 to 49,999 OR belonging to a combined distribution system in which the largest system serves 10,000 to 49,999
1 Jan 08
1 Oct 07
1 Jan 10
1 Oct 10
Crypto monitoring
Review submission
IDSE
Treatment Installation
Possible Extension
Compliance 1 Oct 13
Systems serving fewer than 10,000 and not connected to a larger system
1 Jul 08
1 Apr 08
1 Jul 10
1 Oct 12
1 Oct 14
Compliance if Crypto Monitoring
E. coli
Crypto monitoring
Review submission
IDSE
Treatment Installation
Possible Extension
Compliance if no Crypto Monitoring
1 Oct 13
LT2 Plan or bin classification due
Stage 2 IDSE Plan or report due

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6. PROVISIONS OF THE STAGE 2 DBPR.

a. General. There are several provisions of the Stage 2 DBPR discussed in this section. Particular attention should be given to the IDSE because of its complex requirements and because it is the first provision that must be addressed by water systems.

b. IDSE Requirements and Implementation Options.

(1) The IDSE will identify the monitoring locations to be used for complying with the Stage 2 DBPR TTHM and HAA5 MCLs. Installation personnel must determine if the IDSE is applicable to their water system. If an IDSE must be completed, personnel must decide which IDSE option to complete. Finally, compliance deadlines that must be met are based on the water system size. Table 2 identifies the specific IDSE requirements and their respective compliance deadlines. Figure C-2 in Appendix C provides a flow chart to use for determining applicability of the IDSE for an Army water system.

Table 2. Compliance Deadlines for IDSE Requirements.

IDSE Requirement	Compliance Deadlines based on population served (size)[1]				
	CWSs & NTNCWSs serving at least 100,000	**CWSs & NTNCWSs serving 50,000-99,999**	**CWSs & NTNCWSs serving 10,000-49,999**	**CWSs serving <10,000**	**NTNCWSs serving <10,000**
Submit IDSE standard monitoring plan **OR** Submit IDSE system specific study plan **OR** Submit 40/30 Certification **OR** Receive very small system waiver from State	1 October 2006	1 April 2007	1 October 2007	1 April 2008	Not applicable
Complete standard monitoring or system specific study	30 September 2008	31 March 2009	30 September 2009	31 March 2010	Not applicable
Submit IDSE Report	1 January 2009	1 July 2009	1 January 2010	1 July 2010	Not applicable

[1]Wholesale and consecutive systems that are part of a combined distribution system (CDS) must comply with the deadlines for the largest water system in the CDS.

(2) The IDSE must be completed by all CWS (of all sizes) and NTNCWS serving at least 10,000 people that use a primary or residual disinfectant other than UV, or that deliver water that has been treated with a primary or residual disinfectant other than UV. CWSs serving less than 500 people that have conducted TTHM and HAA5 monitoring under the Stage 1 DBPR do not have to conduct an IDSE, unless notified otherwise by their State or the EPA. These small systems will receive a Very Small System (VSS) waiver. Note that Army water systems classified by the State primacy agent as a consecutive water system must conduct an IDSE on the same schedule as the largest system to which it is connected (i.e., the combined distribution system). Water systems required to conduct an IDSE must meet the compliance deadlines shown in Figure 1 based on their system sizes.

(3) After determining if your water system must conduct an IDSE, you must decide which IDSE option is right for your installation. There are three options: 1) Standard Monitoring (SM); 2) System-Specific Study (SSS), and 3) 40/30 Certification. These options are discussed in detail in the following sections. The EPA has developed tools to help water systems decide which option is right for them. EPA developed two IDSE Guidance Manuals; one is a comprehensive manual for water systems of all size and the other is for water systems serving less than 10,000. They can be found on EPA's Stage 2 DBPR website: http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html. EPA also developed a web-based tool called the "IDSE Tool", which contains a "wizard" component that will ask a series of questions and recommend an IDSE option to pursue. The IDSE Wizard can also be found at EPA's Stage 2 DBPR website. Army water systems should use the EPA IDSE Guidance Manuals or the IDSE Wizard to help decide which option to pursue.

(4) Water systems required to conduct an IDSE must submit plans, reports, or 40/30 certifications to their State. All submissions must be made through EPA's Information Processing and Management Center (IPMC). Because some States will not yet be granted primacy authority for the Stage 2 DBPR when larger systems are required to submit their plans, the EPA developed the IPMC to maintain a central repository for all IDSE submission requirements. This is intended to avoid any confusion about where to submit IDSE information. Once information is submitted, it will be routed to the correct agency (State or EPA) for review. Water systems can submit plans and reports electronically or by hardcopy. Electronic submission can be done using the IDSE Tool through EPA's Stage 2 DBPR website: http://www.epa.gov/safewater/disinfection/stage2/index.html. Instructions for submitting information using the IDSE Tool website can be found at: http://www.epa.gov/safewater/disinfection/tools/pdfs/instructions_mdbp_dcts.pdf. Additionally, information can be submitted via regular mail, fax, or email. Mail hardcopies to:

Stage 2 & LT2 IPMC
P.O. Box 98
Dayton, OH 45401

Fax hardcopies to:
937-586-6557

Email electronic copies to:
Stage2mdbp@epa.gov

(5) The 40/30 Certification option may be used only if your water system's Stage 1 DBPR monitoring results are less than half of the TTHM and HAA5 MCLs (i.e., 0.040 mg/L for TTHM and 0.030 mg/L for HAA5) for every single sample collected over a specified period of time (consisting of eight consecutive calendar quarters of results). If your water system qualifies for 40/30 Certification, there is no further requirement for the IDSE. Qualifying systems must submit 40/30 certifications to the Primacy agency by the deadlines specified in Table 2.

(6) The SM option requires 1 year of DBP monitoring throughout the distribution system on a specified schedule. The number of samples required depends on the population served. Table 3 shows IDSE monitoring frequencies and locations for the SM option. Laboratory costs for Army water systems using this option will range from about $10,000 (for water systems serving up to 10,000 persons) to $50,000 (for water systems serving more than 50,000 persons). Army water systems conducting this monitoring must continue to conduct the required Stage 1 DBPR monitoring (i.e., this monitoring is in addition to the required Stage 1 DBPR monitoring).

(a) Development of the monitoring plan is the first step of the SM option. The plan identifies the sampling locations expected to have elevated DBPs. Sampling locations are determined using existing data (Stage 1 DBP compliance monitoring, disinfectant residual monitoring, other water quality data, and maps). The submitted plan must at least contain the following three elements: 1) distribution system schematics with locations and dates of projected SM option monitoring and Stage 1 DBPR monitoring; 2) justification for all SM option locations selected with data used to select those sites, and 3) population served and source water type [surface water, groundwater, or ground water under direct influence (GWUDI)]. Submission of the distribution system schematic is a recognized security concern. Accordingly, EPA developed guidance on submitting schematics that do not include sensitive information. Submitted schematics should be either: 1) a schematic of pipes with no landmarks that indicate entry points, tanks, and monitoring locations, or 2) a city road map without pipes that only indicate boundaries, entry points, tanks, and monitoring locations. In addition to following EPA's security guidance, Army water systems should have installation security personnel review distribution system schematics prior to submitting them to ensure no classified or sensitive information is included. More specific guidance on developing a SM plan is provided in EPA's IDSE Guidance Manuals which are available on EPA's Stage 2 DBPR website: http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html.

Table 3. IDSE Monitoring Frequencies and Locations.

Source Water Type	Population size category	Monitoring periods and frequency of sampling	Distribution system monitoring locations[1]				
			Total per monitoring period	Near entry points	Average residence time	High TTHM locations	High HAA5 locations
Surface Water and GWUDI[3]	<500 consecutive systems	One (during peak historical month)[2]	2	1	--	1	--
	<500 non-consecutive systems		2	--	--	1	1
	500-3,300 non-consecutive systems	Four (every 90 days)	2	1	--	1	--
	500-3,300 consecutive systems		2	--	--	1	1
	3,301-9,999		4	--	1	2	1
	10,000-49,999	Six (every 60 days)	8	1	2	3	2
	50,000-249,999		16	3	4	5	4
Ground Water	<500 consecutive systems	One (during peak historical month)[2]	2	1	--	1	--
	<500 non-consecutive systems		2	--	--	1	1
	500-9,999	Four (every 90 days)	2	--	--	1	1
	10,000-99,999		6	1	1	2	2

[1]A dual sample set (i.e., a TTHM and an HAA5 sample) must be taken at each monitoring location during each monitoring period.
[2]The peak historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature.
[3]Groundwater Under the Direct Influence (GWUDI).

(b) The State has up to 1 year to review submitted SM plans. In many cases, plans will be reviewed and water systems will be notified of approval. Once approved water systems can then conduct the year-long SM monitoring. If the water system has not heard from the State within 1 year, it can be assumed its plan was approved. States will notify water systems if modifications or changes are necessary prior to conducting the monitoring. It is likely that many States will allow early submission of SM plans, but check with your State to be sure it is allowable.

(c) Once SM plans are approved, water systems must conduct the year-long monitoring and then develop and submit the final IDSE SM report identifying the future Stage 2 DBPR monitoring locations. Once the monitoring is complete, water systems must use all available data to determine the final Stage 2 DBPR monitoring locations. The EPA provides a methodology using a step-wise approach for each type of data available to your water system (i.e., DBP data, disinfectant residual data). The SM report must contain the following

information: 1) all Stage 1 DBPR compliance monitoring and SM monitoring results; 2) a distribution system schematic if changed from the submitted SM plan; 3) an explanation of deviations from the SM plan, and 4) recommendations and justifications for Stage 2 DBPR compliance monitoring locations and sample collection times. Once completed, the report must be submitted to the State using the IPMC. More specific information on determining final Stage 2 DBPR compliance monitoring sites and completing the SM report can be found in EPA's IDSE Guidance Manuals (http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html).

(7) The SSS option can be met using two different approaches: 1) use of existing TTHM and HAA5 monitoring data covering a wide range of sample locations above and beyond what's required under the Stage 1 DBPR, and 2) use of a hydraulic model to simulate water age in the distribution system in conjunction with a one-time TTHM and HAA5 sampling event. Some water systems have detailed knowledge of their distribution system by way of ongoing hydraulic modeling or very robust DBP monitoring plans that can provide equivalent or superior monitoring site selection information compared to the SM option.

(a) For a water system to be eligible to use the existing DBP monitoring data approach for the SSS option there must be a minimum amount of DBP data available beyond what is required under Stage 1 DBPR compliance monitoring. Additionally, the DBP data must be collected within 5 years of the IDSE plan submission date and must include samples collected during the month of peak historical DBP levels. The minimum number of sample sites is equivalent to the number of monitoring locations required under the SM option (Table 3) plus the number of Stage 2 compliance monitoring locations (Table 7). The total number of sample sites is shown in Table 4. If your water system has this data, then you can comply with the IDSE using this option and submit the SSS – existing DBP data plan for review. The submitted plan must at least contain: 1) DBP data; 2) certification that data includes all Stage 1 DBPR compliance and non-compliance data collected within the specified time frame; 3) certification that data is representative of the entire distribution system and no significant treatment changes occurred since samples were collected; 4) distribution system schematics meeting the same requirements listed in the SM option [see Section 6b(6)(a)], and 5) population and system type. If your water system has most of the required data but is lacking a few samples, the State may allow additional DBP monitoring to make up for the lacking data. However, if too much data is lacking based on State review of the plan, the State may require your water system to conduct the SM option. If the SSS – existing data plan is approved, the water system must submit a final report to the State containing: 1) DBP data; 2) a distribution system schematic if changed from the plan; 3) explanation of any deviations in the submitted plan; 4) data used to select Stage 2 monitoring locations showing the data adequately characterized DBP levels throughout the entire distribution system, and 5) recommendations and justifications for Stage 2 DBPR monitoring locations and sample collection times. Similar to the SM option, water systems must use all available data to determine final Stage 2 DBPR compliance monitoring sites. The EPA provides a step-wise methodology to determine these monitoring sites contained in the IDSE Guidance Manuals. Once completed, the report must be submitted to the State. More specific information

on completing the final report and determining Stage 2 DBPR compliance monitoring sites is provided in EPA's IDSE Guidance Manuals (http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html).

Table 4. IDSE SSS – Existing DBP Data Option Minimum Sample Requirements.

System Type	Population size category	Number of monitoring locations	Number of Samples	
			TTHM	HAA5
Surface Water and GWUDI	<500	3	3	3
	500-3,300	3	9	9
	3,301-9,999	6	36	36
	10,000-49,999	12	72	72
	50,000-249,999	24	144	144
Ground Water	<500	3	3	3
	500-9,999	3	9	9
	10,000-99,999	12	48	48

(b) The SSS – hydraulic model option is ideal for systems with existing, calibrated hydraulic models. Many large systems have existing hydraulic models and this option would be less expensive compared to the large number of samples required under the SM option. Water systems that do not have an existing model should consider developing a model for meeting the requirements of the IDSE. A calibrated hydraulic model will have several advantages. In addition to complying with IDSE requirements, a calibrated hydraulic model is an effective tool for water security concerns and emergency response needs. In a suspected intentional (or unintentional) contamination event, a calibrated hydraulic model will help determine the extent of contamination, allowing for a quicker response to isolate and reduce the spread of contamination, alert consumers in affected areas, ultimately reducing the risk of affected consumers. Additionally, a calibrated hydraulic model is useful in master planning purposes when an installation is faced with an increasing population requiring additional infrastructure. A hydraulic model will provide critical planning information on distribution system hydraulics (i.e., providing adequate quantities and pressures). The development of a calibrated hydraulic model will require a higher capital cost compared to the SM option. However, the additional benefits of a hydraulic model may outweigh the cost of developing one. Army installations that meet any of the following criteria may be good candidates for the SSS – hydraulic model option:

- Installations with existing hydraulic models (recently calibrated or not);
- Installations with up-to-date electronic water system data; or
- Installations with potential future population growth requiring additional water infrastructure [e.g., Base Realignment and Closure (BRAC) installations].

i. Water systems choosing the hydraulic model option must demonstrate by way of their submitted plan that their hydraulic model is already significantly developed, calibrated, and will accurately represent their distribution system. At a minimum, hydraulic models at the time of plan submission must meet the following criteria: 1) model must be an extended period simulation model; 2) must simulate 24-hour variation in demand and show a consistent, repeating pattern; 3) must represent 75% of pipe volume, 50% of pipe length, all pressure zones, all 12-inch and larger diameter pipes, and all 8-inch and larger pipes connecting pressure zones; 4) must be calibrated or have calibration plans in place, and 5) all calibration must be completed no later than 12 months after plan submission. As part of this plan, the water system is required to conduct one round of DBP sampling to verify the accuracy of the model. The submitted plan must contain the information in Table 5. The State will review and determine if the model is acceptable. If not, the State will require the water system to correct any deficiencies in the model or require the system to conduct the SM option. Army installations that do not currently have a hydraulic model must also take this into account. A significant amount of resources, compared to the SM option, will likely be necessary to pursue this option.

Table 5. IDSE SSS-Hydraulic Model Option Minimum Plan Submission Requirements.

Data demonstrating percent of total pipe volume and length	Description and associated data of calibration activities
Model output	Plans for one-round DBP sampling
Explanation of how all criteria will be met within 12 months of plan submission	Distribution system schematic [see Section 6b(6)(a) for security concerns]
Population data	System type

ii. Once the State approves the plan, the water system must complete development and calibration of the model and conduct one round of DBP sampling to verify the Stage 2 DBPR monitoring locations identified using the model. The final report must then be developed and submitted to State. The final report must contain: 1) all Stage 1 DBPR monitoring data collected during the period of the SSS; 2) a distribution system schematic if changed from the plan; 3) explanation of any deviations in the submitted plan; 4) data used to select Stage 2 monitoring locations showing that the data adequately characterized DBP levels throughout the entire distribution system; 5) final model information relating to plan submission requirements, and 6) recommendations and justifications for Stage 2 DBPR monitoring locations and sample collection times. Once completed, the report must be submitted to the State. More specific information on completing the SSS report and determining Stage 2 DBPR compliance monitoring sites will be provided in EPA's IDSE Guidance Manual.

(8) Army water systems must decide if the IDSE is applicable, determine which IDSE option to pursue, and ensure that requirements are met by the compliance deadlines. Army consecutive water systems that are required to comply with Stage 2 DBPR provisions (i.e.,

systems subject to NPDWRs or directed by a Primacy agency to comply) must meet compliance dates for the largest water system in the CDS. Most Army water systems will have to submit their monitoring plan by April 2007, October 2007, or April 2008; complete their IDSE by March 2009, September 2009, or March 2010; and submit their final IDSE report by July 2009, January 2010, or July 2010. For the majority of Army water not eligible for a VSS or the SSS – existing DBP option, the SM option will likely be the least costly alternative. Although the SSS – hydraulic model option is more costly, the potential security/emergency response and master planning benefits may outweigh the initial cost of developing the model. Because the IDSE provision is a multi-year provision, affected Army water systems must ensure funds are programmed and available for the duration of the IDSE. There are several resources available to Army water systems to assist them in meeting the IDSE requirements. The EPA's IDSE Guidance Manual (http://www.epa.gov/safewater/disinfection/stage2/index.html) and IDSE Wizard (http://www.epa.gov/safewater/disinfection/tools/tools-idse.html), located on EPA's Stage 2 DBPR website, are excellent sources of information. State primacy agencies will also be available to help meet IDSE requirements. Additionally, the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) (www.usachppm.com) stands ready to assist water systems in meeting the IDSE requirements.

c. Stage 2 DBPR Compliance Monitoring.

(1) Once the IDSE is completed and is submitted to the State, water systems have 3 years before Stage 2 DBPR compliance monitoring begins at the locations identified in the IDSE. During these 3 years prior to beginning Stage 2 DBPR compliance monitoring, water systems realizing (as a result of the IDSE) they will not be able to meet the Stage 2 DBPR MCLs, must install treatment and/or modify operational practices to reduce DBPs. A 2-year extension may be granted by the State for capital upgrades. Table 6 shows the dates when systems must begin Stage 2 DBPR compliance monitoring. For most Army water systems, Stage 2 DBPR monitoring begins October 2012 or October 2013. For water systems that must pursue treatment and/or operational modifications to meet the Stage 2 DBPR MCLs, EPA developed Best Available Treatments (BATs) for these systems to consider [see Section 6c(6)].

Table 6. Compliance Deadlines to Begin Stage 2 DBPR Compliance Monitoring.

Water System Size (population served)	Compliance Deadline
CWSs & NTNCWSs serving at least 100,000	1 April 2012
CWSs & NTNCWSs serving 50,000-99,999	1 October 2012
CWSs & NTNCWSs serving 10,000-49,999	1 October 2013
CWSs & NTNCWSs serving <10,000	1 October 2013 (1 October 2014 if *Cryptosporidium* monitoring is required under the LT2ESWTR).

(2) The Stage 2 DBPR routine compliance monitoring frequencies and locations applicable to Army water systems are shown in Table 7. The monitoring locations listed in Table 7 will have been identified in the IDSE. For example, a surface water (SW) or GWUDI water system serving 10,000-49,999 must monitor quarterly at four distribution system sites – two representing locations in the distribution system with the highest levels of TTHMs, one representing a location with the highest levels of HAA5s, and one sampling location that is currently used as Stage 1 DBPR sampling location that indicates elevated HAA5 or TTHM levels. The IDSE Guidance manual provides a sampling site selection protocol to determine these locations. Water systems are allowed to reduce monitoring frequencies as long as specific criteria are continually met. Surface water or GWUDI systems that serve less than 500 people are not eligible for reduced monitoring. All other water systems with at least 1 year of routine monitoring results with LRAAs less than half the TTHM and HAA5 MCLs (0.040 mg/L and 0.030 mg/L, respectively) can reduce monitoring to the frequency and locations specified in the rule. Water systems conducting reduced monitoring at a quarterly frequency must return to routine monitoring if any LRAA exceeds half the TTHM or HAA5 MCLs or the source water annual average total organic carbon (TOC) level exceeds 4.0 mg/L for systems treating surface water or GWUDI. Systems conducting reduced monitoring at an annual frequency must return to routine monitoring if any LRAA exceeds 75% of the TTHM or HAA5 MCLs (0.060 mg/L and 0.045 mg/L, respectively) or the source water annual average TOC level exceeds 4.0 mg/L for systems treating SW or GWUDI. Specific details on reduced monitoring frequencies and locations can be found in the final rule (reference 5).

Table 7. Stage 2 DBPR Routine Compliance Monitoring Frequencies and Locations.

Source water type	Population size category	Monitoring frequency[1]	Distribution system monitoring location			
			Total per monitoring period[2]	Highest TTHM locations	Highest HAA5 locations	Existing Stage 1 DBPR locations
SW or GWUDI	<500	Per year	2	1	1	--
	500 – 3,300	Per quarter	2	1	1	--
	3,301 – 9,999	Per quarter	2	1	1	--
	10,000 – 49,999	Per quarter	4	2	1	1
	50,000 – 249,999	Per quarter	8	3	3	2
Ground Water	<500	Per year	2	1	1	--
	500 – 9,999	Per year	2	1	1	--
	10,000 – 99,999	Per quarter	4	2	1	1

[1]All systems must monitor during month of highest DBP concentrations.
[2]Dual sample sets (one TTHM and one HAA5 sample). Systems on annual monitoring and SW or GWUDI systems serving 500 – 3,300 are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at locations with highest TTHM and HAA5 concentrations, respectively.

(3) Water systems are in compliance with the TTHM and HAA5 MCLs if the annual sample (for annual monitoring) or the LRAA (for quarterly monitoring) is less than or equal to the MCLs. If an annual sample exceeds the MCL, the system is not considered in violation of the MCL, but it must immediately begin quarterly monitoring. A water system is considered out of compliance if the LRAA of the quarterly samples for the past 4 quarters exceeds the MCL.

(4) The Stage 2 DBPR MCLs are enforceable health-based standards. The Stage 2 DBPR retains the existing Stage 1 DBPR TTHM MCL of 0.080 mg/L and the HAA5 MCL of 0.060 mg/L. However, the difference between the Stage 1 DBPR MCLs and the Stage 2 DBPR is how these MCLs are calculated. The Stage 2 DBPR MCL is calculated using a LRAA concept. For an LRAA, the annual average must be calculated at each monitoring location. Figure 2 provides a visual explanation of the LRAA concept and a comparison with the Stage 1 DBPR RAA concept.

(5) The Stage 2 DBPR continues to regulate MRDLs by retaining the same MRDLs from the Stage 1 DBPR.

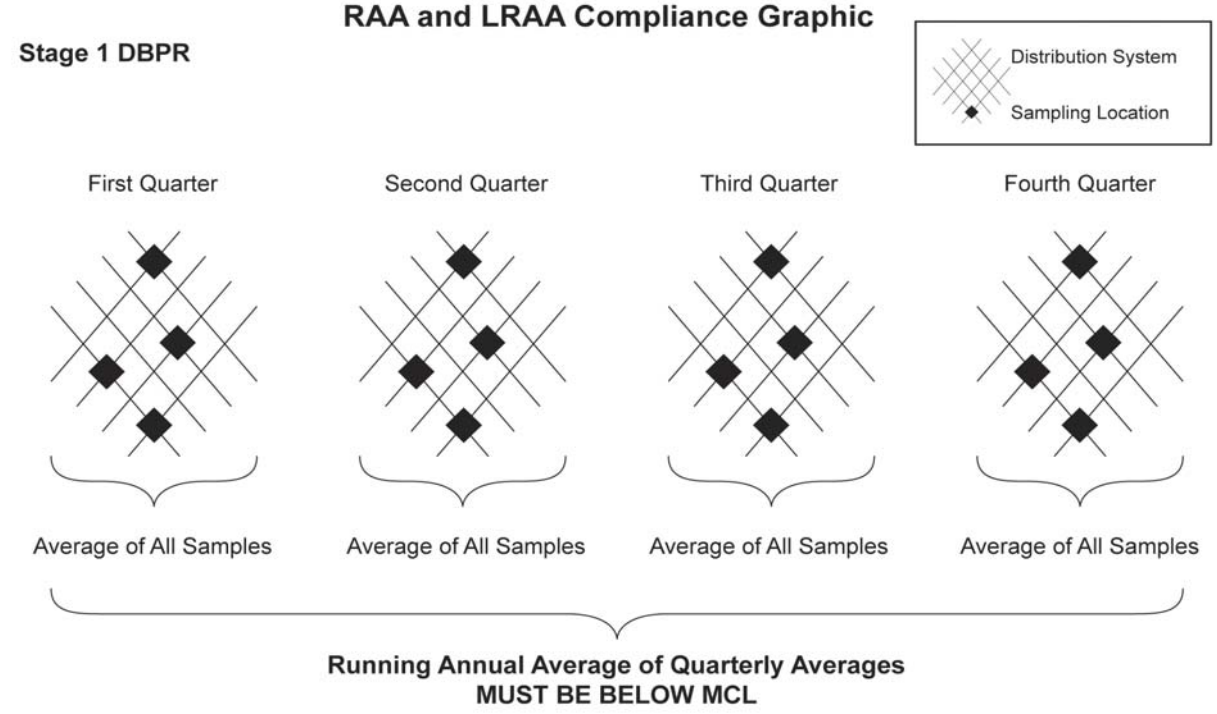
d. Best Available Technologies.

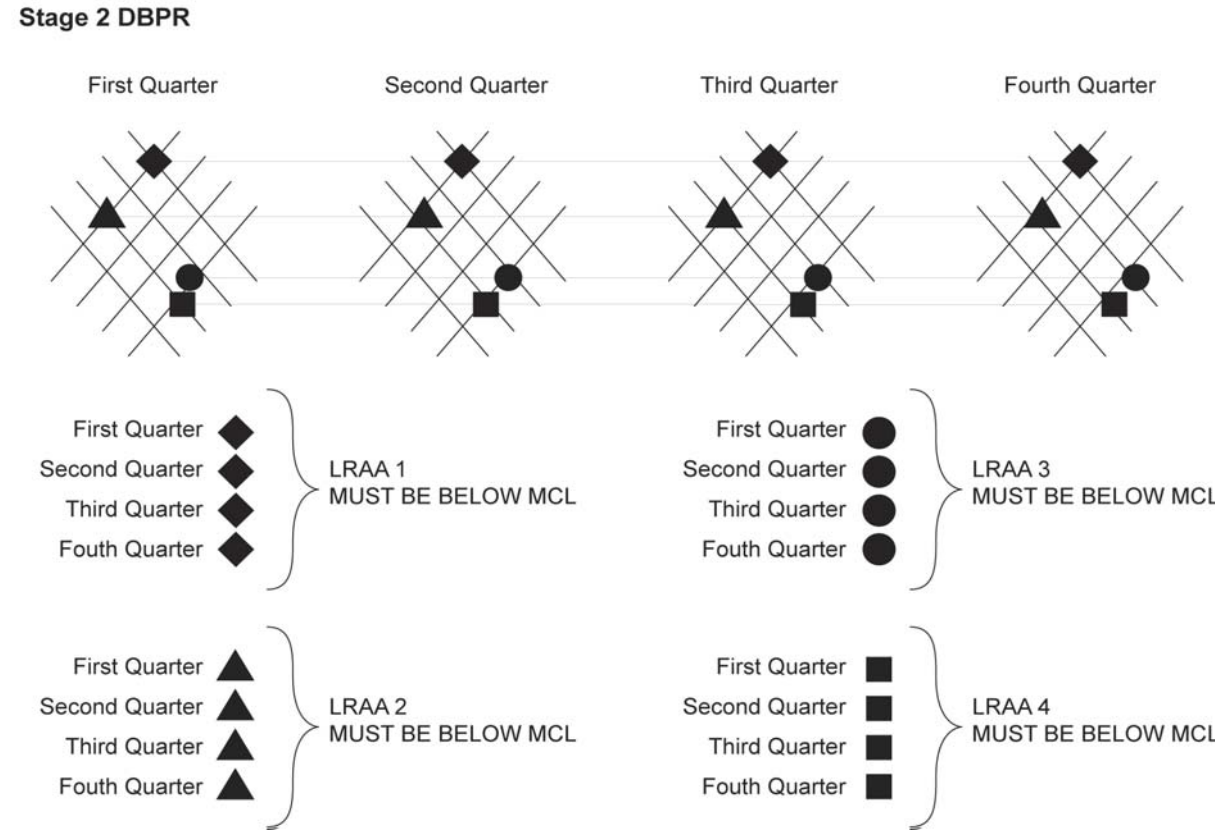
(1) The Stage 2 DBPR provides new BATs for TTHM and HAA5 control. There are three BATs identified for water systems treating their own sources: 1) granular activated carbon (GAC) with a 10-minute empty bed contact time based on carbon reactivation every 120 days (GAC10); 2) GAC with a 20-minute empty bed contact time based on carbon reactivation every 240 days (GAC20), and 3) nanofiltration (NF) using membranes with a molecular weight cutoff of 1000 Daltons or less.

(2) There are also BATs identified for consecutive systems based on their size. The BAT for consecutive systems serving at least 10,000 people is chloramination with management of hydraulic flow and storage to minimize residence time in the distribution system. The BAT for smaller consecutive systems is management of hydraulic flow and storage to minimize residence time in the distribution system.

(3) If you determine your water system will not be able to comply with the Stage 2 DBPR MCLs based on your IDSE, then consider these BATs. There are many factors that need to be considered when evaluating treatment or operational changes to determine the best option for your water system (e.g., water quality, technology complexity, safety, regulatory compliance, and cost). An in-depth water system study may need to be conducted to evaluate available compliance alternatives and determine which alternative will best fit the needs of your water system.

FIGURE 2.
RAA and LRAA Compliance Graphic





e. Operational Evaluation Levels.

(1) Water systems in full compliance with Stage 2 DBPR MCLs may still have individual DBP measurements exceeding the TTHM and HAA5 MCLs. Due to the potential health concerns of these elevated levels, the Stage 2 DBPR requires systems to conduct operational evaluations to identify steps that can reduce DBPs at these locations to ensure better, more equitable health protection. This provision of the Stage 2 DBPR is intended to have water systems take a close look at their water quality, treatment, and operational practices and identify ways to reduce DBPs. This provision also serves as an "early warning system" for a possible MCL violation in the following quarter.

(2) Operational evaluation levels are determined using Stage 2 DBPR compliance monitoring results. Equation 1 shows the calculations used to determine if a water system exceeds the operational evaluation level.

Equation 1: $(Q_1+Q_2+2Q_3) / 4$

Where:
Q_3 = current quarter measurement
Q_2 = previous quarter measurement
Q_1 = quarter before previous quarter measurement

This calculation is made for each Stage 2 DBPR compliance monitoring location using both TTHM and HAA5 data. If the results exceed either the TTHM MCL (0.080 mg/L) or the HAA5 MCL (0.060 mg/L), then a water system must conduct an operational evaluation and submit an operational evaluation report to the State.

(3) Water systems triggered into conducting an operational evaluation must take a close look at their entire water system from source to tap, evaluating source water quality, treatment, and distribution operational practices to identify ways to better control DBP levels. The operational evaluation is an assessment of system treatment and distribution operational practices, including changes in sources or source water quality, storage tank operations and capacity, and distribution system configuration. From this assessment, water systems must identify aspects of their water system or operation of their water system that may contribute to high TTHM and HAA5 formation. Water systems must then identify actions that could be taken to reduce future operational evaluation level exceedances. Systems must submit their operational evaluation report to the State for review within 90 days after being notified of the analytical results triggering the operational evaluation. The EPA is finalizing guidance for water systems triggered into conducting an operational evaluation. The Operational Evaluation Guidance Manual, expected to be released in mid-2006 will be available at EPA's Stage 2 DBPR website: http://www.epa.gov/safewater/disinfection/stage2/index.html.

f. Maximum Contaminant Level Goals (MCLGs) for Chloroform, Monochloroacetic Acid and Trichloroacetic Acid. The Stage 2 DBPR revised MCLGs for three contaminants from the Stage 1 DBPR. The MCLGs are non-enforceable standards that represent a level at which no known or anticipated adverse health effects occur, allowing for an adequate margin of safety. The chloroform (a THM) MCLG is revised to 0.07 mg/L. The monochloroacetic acid (a HAA) MCLG is revised to 0.07 mg/L. The trichloroacetic acid (a HAA) MCLG is revised to 0.02 mg/L.

g. Analytical Requirements. The Stage 2 DBPR approves new and revised analytical methods and makes corrections to some existing methods. Any laboratory used for Stage 2 DBPR compliance must be a State-certified laboratory capable of using some or all of the approved analytical methods.

h. Reporting and Recordkeeping. Water systems must report Stage 2 DBPR compliance monitoring data to their State within 10 days after the end of the compliance period. Compliance monitoring conducted quarterly or more frequently must be submitted quarterly. Compliance monitoring conducted less frequently must be submitted within 10 days of the end of the monitoring period. IDSE-related reporting requirements must be met as discussed in Section 6b(4) and Table 2. Submitted Stage 2 DBPR TTHM and HAA5 compliance monitoring must include each LRAA calculation and each individual monitoring result. Operational Evaluation Reports must be submitted within 90 days after notification of analytical results triggering the operational evaluation. Finally, all Stage 2 monitoring data, reports, and evaluations must be kept for 10 years.

7. ASSISTANCE.

a. Overview. Several organizations are available to Army water systems in helping them meet the provisions of the Stage 2 DBPR. Resources available to Army water systems include guidance manuals, webcast training, in-person training, and on-site assistance.

b. EPA. EPA recognizes the complexity of this rule and is preparing a variety of resources to assist water systems in complying with all the provisions of the Stage 2 DBPR.

(1) IDSE Guidance Manual. Download at EPA website: http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html. This manual is intended for affected water systems of all sizes and State primacy agencies. It explains IDSE requirements to utilities and provides guidance to States and EPA on reviewing completed IDSE plans and reports. Flow charts, tear-out requirements sheets, templates, and examples are provided to help utilities understand requirements and options for complying. This technical manual provides details on how utilities can use different types of data to help select monitoring sites for the evaluation. One chapter describes a process that primacy agencies can use to review IDSE submissions.

(2) IDSE Guide for Systems Serving < 10,000. Download at EPA website: http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html. This manual is intended for smaller systems and, similar to the IDSE Guidance Manual, explains in detail the IDSE requirements. This manual does not cover the SSS option.

(3) Small System Guidance Manual for the Stage 2 DBPR. Available mid-2006. Download at EPA website: http://www.epa.gov/safewater/disinfection/stage2/compliance.html. This manual's intended for States and small water systems. This manual contains a general introduction and background on the Stage 2 DBPR**,** describes the requirements of the rule that apply to small systems (those serving fewer than 10,000 people), and provides step-by-step guidance on how small systems can comply with Stage 2 DBPR requirements.

(4) Operational Evaluation Guidance Manual. Available mid-2006. Download at EPA website: http://www.epa.gov/safewater/disinfection/stage2/compliance.html. Intended for water systems and States, this manual describes the requirements for operational evaluations and provides guidance for documenting and reporting an operational evaluation level exceedance. The manual provides a methodology for identifying the cause of operational evaluation levels exceedances and the options available to minimize further operational evaluation level exceedances.

(5) Simultaneous Compliance Guidance Manual for the Stage 2 DBPR and LT2ESWTR. Draft available mid-2006. Download at EPA website: http://www.epa.gov/safewater/disinfection/stage2/compliance.html. This manual is intended for water systems making treatment and/or operational changes to comply with these rules. This manual discusses the issues systems will face as they evaluate and implement changes necessary to comply with the Stage 2 DBPR and the LT2ESWTR, while still being required to comply with earlier rules such as the Total Coliform Rule and Lead and Copper Rule. Some of the changes that systems may make can have unanticipated or unwelcome consequences if not properly designed, implemented, and monitored.

(6) Consecutive Systems Guidance Manual for the Stage 2 DBPR. Draft available in 2006. Download at EPA website: http://www.epa.gov/safewater/disinfection/stage2/compliance.html. This manual is intended for consecutive systems and States. This manual provides information on operational and capital changes and strategies that will enable consecutive systems to comply with this rule.

(7) Webcast Training. Showing in January 2007. Information available at EPA website: http://www.epa.gov/safewater/disinfection/training.html. The EPA recently provided free webcasts covering both the Stage 2 DBPR and LT2ESWTR requirements. These will be shown again in January 2007. Intended for States and affected water systems.

(8) In-Person Training. Numerous trainings are scheduled throughout the country for 2006. Information available at EPA website: http://www.epa.gov/safewater/disinfection/training.html. To assist water systems and States, EPA is providing 2-day trainings focusing on the early requirements of the Stage 2 DBPR and LT2ESWTR. Training includes workshops to reinforce and practice key concepts. Some trainings are specifically designed for affected water systems, while other are geared towards States.

(9) IDSE Tool. Located at EPA's Stage 2 website: http://www.epa.gov/safewater/disinfection/tools/tools-idse.html. This online tool consists of two parts – an IDSE "wizard" and an electronic plan and report submission format. The IDSE wizard helps water system determine which IDSE option might be best for them. The tool will also allow water systems to submit their IDSE plans and reports electronically.

(10) EPA Stage 2 DBPR Implementation Team. Email address: Stage2mdbp@epa.gov. Questions regarding the Stage 2 DBPR can be emailed to rule experts at EPA.

(11) Frequently Asked Questions. Located at EPA's website: http://www.epa.gov/ogwdw/drinklink.html. This database will contain many Frequently Asked Questions (FAQs) covering all topics related to the Stage 2 DBPR. If your questions aren't part of the FAQs you can submit your questions here.

(12) Listserv. An email notification service developed by EPA to provide members Stage 2 DBPR and LT2ESWTR notifications, updates, and reminders. Sign up at EPA's website: http://www.epa.gov/safewater/disinfection/.

c. State. State primacy agencies are available for regulatory assistance and consultation. Appendix D provides a listing of State POCs for Stage 2 DBPR assistance.

d. Drinking Water Organizations. The American Water Works Association (AWWA) and the Association of Metropolitan Water Agencies (AMWA) are providing webcast training for both the Stage 2 DBPR and LT2ESWTR. The AMWA website – http://www.amwa.net/mdbp/index.html, provides webcast information along with other resources that are useful. The AWWA website – http://www.awwa.org/, provides webcast training information for these rules. AWWA archives webcasts that have already been presented so they can be watched any time after presentation. Additional resources may be available from these websites in the future.

e. USACHPPM. Phone: 410-436-3919, DSN 584-3919. Website: http://chppm-www.apgea.army.mil/dehe/pgm31/. The USACHPPM Water Supply Management Program provides technical assistance to Army installations in all aspects of drinking water. USACHPPM stands ready to assist Army water systems in complying with the Stage 2 DBPR and LT2ESWTR provisions. Assistance includes all aspects of the IDSE provision – deciding

which IDSE option to pursue, developing sampling plans and hydraulic models, and developing written plans and final reports for submittal to the State. The USACHPPM can also assist Army water systems in evaluating and deciding which treatment modifications or operational changes are most effective to ensure compliance with these rules as well as the comprehensive evaluation required by exceeding operational evaluation levels.

f. U.S. Army Corps of Engineers. The U.S. Army Engineering Research Laboratories, Construction & Engineering Research Laboratory can provide assistance with evaluating and deciding with treatment technology best fits a water system's current and future needs. Contact Mr. Richard Scholze, phone: 217-398-5590, email: Richard.J.Scholze@erdc.usace.army.mil. The U.S. Army Engineer Mobile District can assist installations with engineering and design of a specific treatment technology for their water system. Contact Mr. Joseph Findley, phone: 251-694-4012, email: Joseph.W.Findley@sam.usace.army.mil.

8. IMPACT ON ARMY WATER SYSTEMS.

a. Affected Army Water Systems. The Stage 2 DBPR will provide additional, more equitable health protection from DBPs. The rule applies to PWSs classified as CWSs or NTNCWSs that add a primary or residual disinfectant other than UV light or deliver water that has been treated with a primary or residual disinfectant (other than UV light) must comply with the Stage 2 DBPR. Because Army regulations require Army water systems to disinfect water supplies, the Stage 2 DBPR will affect many U.S. Army water systems. Overseas Army water systems are expected to comply with the Stage 2 DBPR in the future, upon revision of the OEBGD. Most U.S. Army water systems purchasing their water will not likely have to comply with the Stage 2 DBPR since the majority of these systems are not subject to NPDWRs. However, some States may require their purchasing systems to comply with this rule.

b. Stage 2 DBPR Provisions.

(1) IDSE. Affected Army water systems are required to prepare and submit an IDSE plan, and conduct IDSE monitoring to identify new Stage 2 DBPR compliance monitoring sites. Most affected Army water systems are expected to pursue the IDSE Standard Monitoring option incurring laboratory costs ranging from $10,000 - $50,000 depending on their water system size. The System-Specific Study hydraulic model option for the IDSE provision is more expensive but can provide additional benefits for water system security and master planning. Because the IDSE provision is a multi-year provision, affected Army water systems must ensure funds are programmed and available for the duration of the IDSE. Table 8 shows the compliance deadlines the for IDSE rule provision.

(2) Determining Compliance. The Stage 2 TTHM and HAA5 MCLs are the same as the current Stage 1 TTHM 0.080 mg/L and HAA5 0.060 mg/L MCLs, but the significant difference is how compliance with these MCLs is calculated. Under the Stage 1 DBPR, compliance is calculated as a distribution system-wide RAA. Under the Stage 2 DBPR, compliance is

calculated at each monitoring location (i.e., a LRAA). Therefore, the likelihood of systems being in noncompliance with DBP standards may increase under the Stage 2 DBPR. Table 8 shows the compliance deadlines to begin compliance monitoring for determining compliance with the Stage 2 DBPR TTHM and HAA5 MCLs.

Table 8. Compliance Deadlines for Stage 2 DBPR Major Requirements.

Stage 2 DBPR Requirement	CWSs & NTNCWSs serving at least 100,000	CWSs & NTNCWSs serving 50,000-99,999	CWSs & NTNCWSs serving 10,000-49,999	CWSs serving <10,000	NTNCWSs serving <10,000
Submit IDSE Plan	1 October 2006	1 April 2007	1 October 2007	1 April 2008	Not applicable
Complete IDSE monitoring or study	30 September 2008	31 March 2009	30 September 2009	31 March 2010	Not applicable
Submit IDSE Report	1 January 2009	1 July 2009	1 January 2010	1 July 2010	Not applicable
Compliance Monitoring	1 April 2012	1 October 2012	1 October 2013	1 October 2013[1]	

1. 1 October 2014 if *Cryptosporidium* monitoring is required under the LT2ESWTR.

c. Resources for Assistance. Due to these rule complexities, numerous resources for assistance are available to Army water systems to ensure full compliance and better, more equitable health protection for their consumers.

9. ACTIONS FOR ARMY WATER SYSTEMS.

a. Determine Stage 2 DBPR Applicability. Determine if your Army water system must comply with the provisions of the Stage 2 DBPR. If you are a purchasing Army water system you should have been notified by your State if your system must comply with the Stage 2 DBPR. If you are unsure if the Stage 2 DBPR applies to your system contact your State Stage 2 DBPR POC (Appendix D). Available resources:

- Section 5c, page 3
- Flowchart C-1, Appendix C
- Your State's Stage 2 DBPR POC, Appendix D
- http://www.epa.gov/safewater/disinfection/stage2/index.html

b. Determine Stage 2 DBPR Compliance Deadlines. Determine the compliance deadlines that your Army water system must meet. Available resources:

- Figure 1, page 5
- EPA Stage 2 DBPR Fact Sheet, Appendix E

c. Determine IDSE Applicability. Determine if your Army water system must comply with the IDSE provision of the Stage 2 DBPR. Available resources:

- Section 6b, page 7
- Begin with Flowchart C-1, Appendix C
- Your State's Stage 2 DBPR POC, Appendix D
- EPA IDSE Tool – http://www.epa.gov/safewater/disinfection/tools/tools-idse.html
- EPA IDSE Guidance Manuals – http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html

d. Choose the IDSE Option to Pursue. Determine which IDSE option is right for your Army water system (standard monitoring, system-specific study hydraulic model or existing data, or 40/30 certification). Available resources:

- Section 6b(3), (5)-(7), pages 8-11
- Your State's Stage 2 DBPR POC, Appendix D
- EPA IDSE Tool – http://www.epa.gov/safewater/disinfection/tools/tools-idse.html
- EPA IDSE Guidance Manuals – http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html

e. Plan Resources for Conducting the IDSE. Ensure funding is programmed and available to conduct the multi-year IDSE provision of the Stage 2 DBPR. Estimated analytical costs for Army water systems pursuing the SM option range from $10,000 - $50,000. Army water systems must plan and budget for plan development and IDSE report development. Estimated costs for Army water systems pursuing the SSS hydraulic modeling option will be higher than the SM option. However, additional security/emergency response, master planning, and other benefits are realized. Army water systems with existing hydraulic models should consider the SSS hydraulic modeling option.

f. Conduct the IDSE. Generally, three major requirements of the IDSE provision must be met – development and submittal of a plan or 40/30 certification to their State; completion of monitoring (SM option) or system-specific study (SSS), and preparation and submittal of the final report to their State. Available resources:

- Section 6b(4)-(7), pages 8-11
- Your State's Stage 2 DBPR POC, Appendix D

- EPA IDSE Guidance Manuals – http://www.epa.gov/safewater/disinfection/stage2/compliance_idse.html
- USACHPPM Water Supply Management Program – Phone: 410-436-3919, DSN 584-3919; http://chppm-www.apgea.army.mil/dehe/pgm31/

g. Determine Ability to Comply with Stage 2 DBPR MCLs. Determine if significant operational or treatment changes will be necessary to meet the Stage 2 DBPR TTHM and HAA5 MCLs upon completion of the IDSE. If treatment process upgrades or operational changes are required, resources should be budgeted well in advance to meet compliance deadlines. In some cases, a 2-year extension may be granted by the State for capital upgrades. Upgrades and/or operational changes should be made prior to conducting compliance monitoring to avoid MCL exceedances. Consider contracting to have an in-depth water system study conducted to evaluate compliance alternatives. Available resources:

- EPA Simultaneous Compliance Guidance Manual for the Stage 2 DBPR and LT2ESWTR. Draft available mid-2006 – http://www.epa.gov/safewater/disinfection/stage2/compliance.html
- EPA Small System Guidance Manual for the Stage 2 DBPR. Draft available mid-2006 – http://www.epa.gov/safewater/disinfection/stage2/compliance.html
- USACHPPM Water Supply Management Program – phone: 410-436-3919, DSN 584-3919; http://chppm-www.apgea.army.mil/dehe/pgm31/
- U.S. Army Corps of Engineers Engineering and Support Center, Huntsville. phone: 256-895-1501. Website: http://www.hnd.usace.army.mil/index.asp.
- The U.S. Army Engineering Research Laboratories, Construction & Engineering Research Laboratory for treatment technology assistance – contact Mr. Richard Scholze, phone: 217-398-5590, email: Richard.J.Scholze@erdc.usace.army.mil.
- The U.S. Army Engineer Mobile District for engineering and design assistance – contact Mr. Joseph Findley, phone: 251-694-4012, email: Joseph.W.Findley@sam.usace.army.mil.

h. Conduct Compliance Monitoring. Water systems must monitor at compliance sites identified in their IDSE. Water systems are in compliance with the TTHM and HAA5 MCLs if the annual sample (for systems sampling annually) or the LRAA (systems sampling quarterly) is less than or equal to the DBP MCLs. Available resources:

- Section 6c, pages 14-16
- EPA Small System Guidance Manual for the Stage 2 DBPR. Draft available mid-2006 – http://www.epa.gov/safewater/disinfection/stage2/compliance.html

APPENDIX A
REFERENCES

1. Public Law 104-182, 6 Aug 1996, The Safe Drinking Water Act Amendments of 1996.

2. Pontius, F.W. ed., Drinking Water Regulation and Health, 2003, John Wiley & Sons, NY.

3. National Interim Primary Drinking Water Regulations; Control of Trihalomethanes in Drinking Water; Final Rule, 44 *Federal Register* 68624, 29 November 1979.

4. Final Rule, NPDWR: Disinfectants and Disinfection By-products, 63 *Federal Register* 69390, 16 December 1998.

5. National Primary Drinking Water Regulations(NPDWR): Stage 2 Disinfectants and Disinfection By-products Rule; Final Rule, 71 *Federal Register* 388, 4 January 2006.

6. NPDWR: Stage 2 Disinfectants and Disinfection By-products Rule; National Primary and Secondary Drinking Water Regulations: Approval of Analytical Methods for Chemical Contaminants; Proposed Rule, 68 *Federal Register* 49548, 18 August 2003.

7. Title 40, Code of Federal Regulations, 2005 rev., Part 141, NPDWR.

8. Army Regulation 420-49, Facilities Engineering Utility Services, 19 September 2005.

9. Department of Defense (DOD) Overseas Environmental Baseline Guidance Document, 15 March 2000.

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APPENDIX B
STAGE 2 DBPR DEFINITIONS AND ABBREVIATIONS

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AMWA – Association of Metropolitan Water Agencies

AWWA – American Water Works Association

BAT – Best Available Treatment. The best technology, treatment techniques, or other means which the EPA Administrator finds, after examination for efficacy under filed conditions and not solely under laboratory conditions, are available (taking cost into consideration).

BRAC – Base Realignment and Closure

CDS – Combined Distribution System. The interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

CFR – Code of Federal Regulations

Consecutive system – A public water system that receives some or all of its finished water from one or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

CWS – Community Water System. A public water system providing water to at least 15 service connections used by year-round residents or regularly serving at least 25 year-round residents.

DBP – Disinfection By-Product

DOD – Department of Defense

Dual sample set – A set of two samples collected at the same time and same location, with one sample analyzed for TTHM and the other sample analyzed for HAA5. Dual sample sets are collected for the purposes of conducting an IDSE under the Stage 2 DBPR and determining compliance with the TTHM and HAA5 MCLs under the Stage 2 DBPR.

EPA – U.S. Environmental Protection Agency

GAC – Granular Activated Carbon

GAC10 – A listed BAT for compliance with various regulated organic chemicals. GAC10 means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days. For compliance with the Stage 2 DBPR TTHM and HAA5 MCLs the reactivation rate shall be 120 days.

GAC20 – A listed BAT for compliance with the Stage 2 DBPR TTHM and HAA5 MCLs. GAC20 means granular activated carbon filter beds with an empty-bed contact time of

20 minutes based on average daily flow and a carbon reactivation frequency of every 240 days.

GWUDI – Groundwater Under the Direct Influence of surface water. Any water beneath the surface of the ground with either (1) significant occurrence of insects, other macroorganisms, or large diameter pathogens; or (2) significant and relatively rapid shifts in water characteristics such as turbidity or temperature which closely correlate to climatological or surface water conditions.

HAA5 – Five Haloacetic Acids. The sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

IDSE – Initial Distribution System Evaluation

IPMC – Information Processing and Management Center. A receiving, processing, and mailing facility with a web-based data management system that allows EPA and states to access, track, and respond to IDSE submissions.

LRAA – Locational Running Annual Average. The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

LT2ESWTR – Long Term 2 Enhanced Surface Water Treatment Rule

MCL – Maximum Contaminant Level. The maximum permissible level of a contaminant in water which is delivered to any user of a public water system. A health-based standard

MCLG – Maximum Contaminant Level Goal. The maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. Maximum contaminant level goals are non-enforceable health goals.

mg/L – milligrams per liter

MRDL – Maximum Residual Disinfectant Level. A level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects.

NF – Nanofiltration. A listed BAT for Stage 2 DBPR compliance. A low-pressure-driven membrane process that can reject particles or contaminants as small as 0.001 μm.
NOM – Natural Organic Matter

NPDWR – National Primary Drinking Water Regulations as codified in CFR Part 141

NTNCWS – Non-Transient Non-Community Water System. A public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per yea.r

OEBGD – Overseas Environmental Baseline Guidance Document

POC – Point-of-Contact

PWS – Public Water System. A system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

RAA – Running Annual Average

SDWA – Safe Drinking Water Act

SM – Standard Monitoring option for the IDSE provision

Stage 1 DBPR – Stage 1 Disinfectants and Disinfection By-Products Rule

Stage 2 DBPR – Stage 2 Disinfectants and Disinfection By-Products Rule

SSS – System-Specific Study option for the IDSE provision. This option consists of two alternatives – a hydraulic model study and use of existing monitoring data.

SW – Surface Water

THM – Trihalomethanes

TTHM – Total Trihalomethanes. The sum of the concentration in milligrams per liter of the trihalomethane compounds (trichloromethane [chloroform], dibromochloromethane, bromodichloromethane, and tribromomethane [bromoform]), rounded to two significant figures.

TOC – Total Organic Carbon

USACHPPM – U.S. Army Center for Health Promotion and Preventive Medicine

UV – Ultraviolet Light

VSS – Very Small System waiver.

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APPENDIX C
STAGE 2 DBPR FLOW CHARTS

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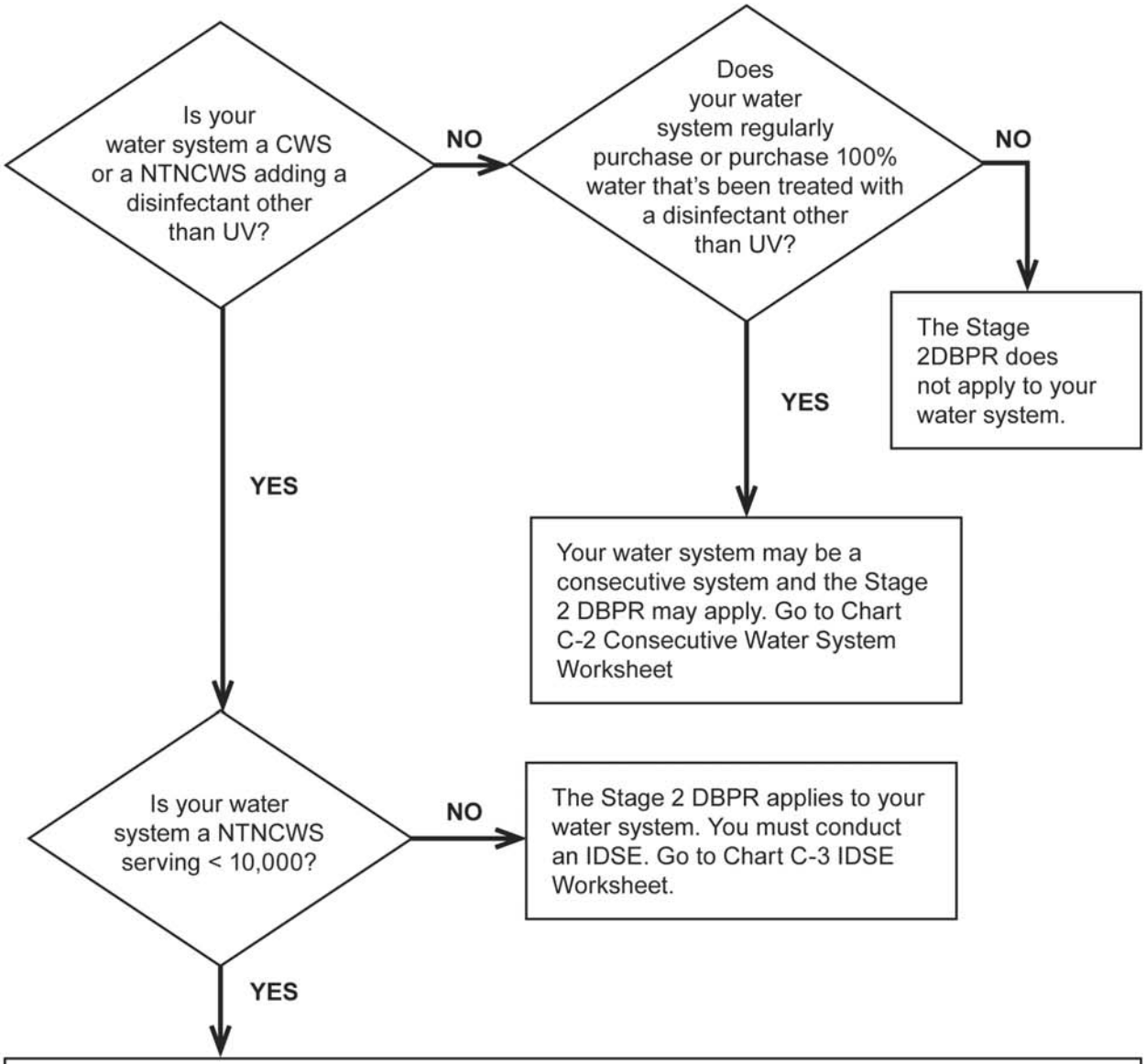
Chart C-1
Stage 2 DBPR and IDSE Applicability Worksheet



The Stage 2 DBPR applies to your water system.

An IDSE is not required for your water system

Calculate the LRAA for each of your Stage 1 DBPR compliance monitoring sites. If any LRAA exceeds the Stage 2 DBPR MCLs, consult with your State. Make plans to reduce DBP levels using operational and/or treatment modifications. Any changes or upgrades to your water system must be completed by 1 October 2013. Your water system may be eligible for a 2-year extension if pursuing a capital cost upgrade.

Your water system must begin Stage 2 DBPR compliance monitoring no later than 1 October 2013. Continue to monitor at Stage 1 DBPR compliance monitoring locations. Consult with your State to determine if additional Stage 2 monitoring locations are necessary . Refer to the Final Rule page 490 (CFR Part 141.622) for detailed information.

Chart C-2
Consecutive Water System Worksheet

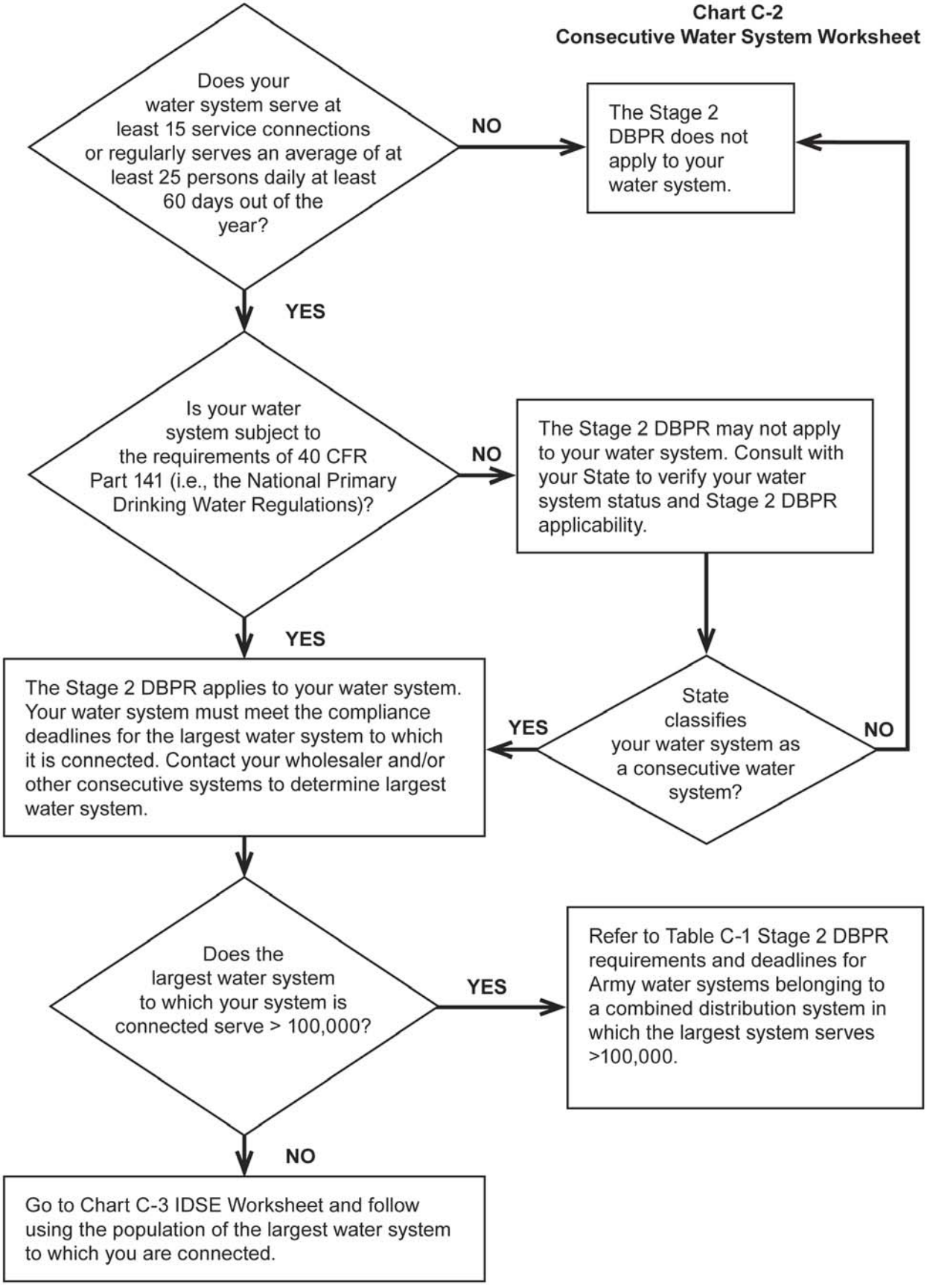
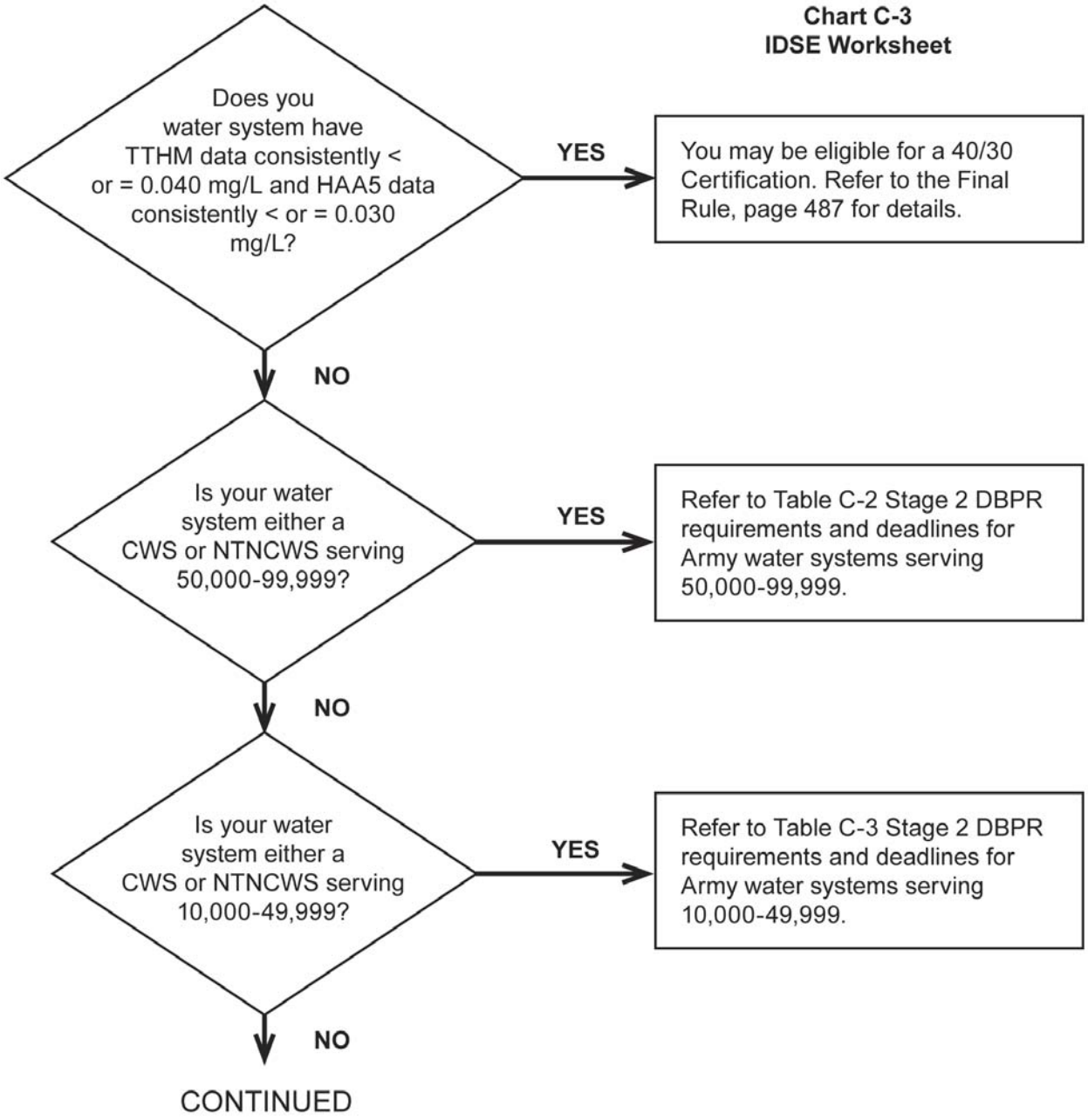


Chart C-3
IDSE Worksheet



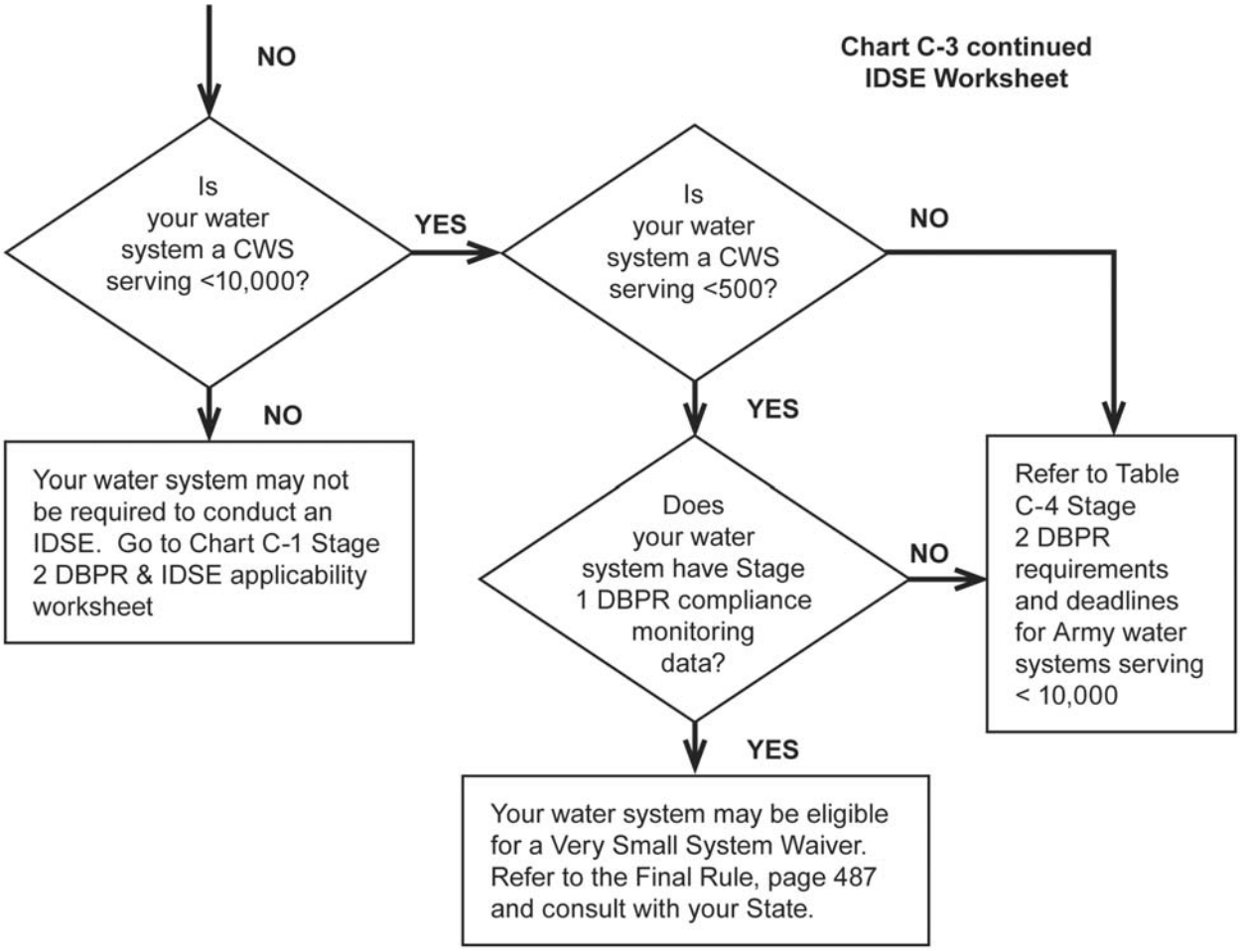


Chart C-3 continued
IDSE Worksheet
NO
Is your water system a CWS serving <10,000?
YES
Is your water system a CWS serving <500?
NO
NO
Your water system may not be required to conduct an IDSE. Go to Chart C-1 Stage 2 DBPR & IDSE applicability worksheet
YES
Does your water system have Stage 1 DBPR compliance monitoring data?
NO
Refer to Table C-4 Stage 2 DBPR requirements and deadlines for Army water systems serving < 10,000
YES
Your water system may be eligible for a Very Small System Waiver. Refer to the Final Rule, page 487 and consult with your State.

TABLE C-1
STAGE 2 DBPR REQUIREMENTS FOR
ARMY WATER SYSTEMS BELONGING TO A COMBINED DISTRIBUTION SYSTEM IN WHICH THE LARGEST SYSTEM SERVES 100,000 OR MORE

COMPLIANCE DEADLINE	STAGE 2 DBPR REQUIREMENT	NOTES	GUIDANCE MATERIALS
1 OCTOBER 2006	Submit your IDSE Plan	-Decide on pursuing the SM or SSS IDSE option. -Develop and submit your IDSE plan for review. Include minimum submission requirements.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Wizard -EPA IDSE Guidance Manual -EPA Consecutive System Stage 2 Guidance Manual
1 OCTOBER 2007	State (or EPA) must complete review of your ISDE Plan	The primacy agent has up to 1 year to review your plan. You may be notified of approval or modifications before the deadline.	
30 SEPTEMBER 2008	Complete your IDSE	You must complete the conduct of your IDSE plan by this date to allow time to develop the IDSE final report.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Guidance Manual -EPA Consecutive System Stage 2 Guidance Manual
1 JANUARY 2009	Submit your IDSE Final Report	Include minimum submission requirements.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Guidance Manual -EPA Consecutive System Stage 2 Guidance Manual
1 APRIL 2012	1) Begin Stage 2 DBPR Compliance Monitoring 2) Complete treatment upgrades if necessary to comply with Stage 2 DBPR MCLs	Your water system must begin monitoring at the sites identified in the IDSE for compliance with the Stage 2 DBPR MCLs.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA Simultaneous Compliance Manual for the Stage 2 DBPR and LT2ESWTR -EPA Consecutive System Stage 2 Guidance Manual -EPA Operational Evaluation Guidance Manual
1 APRIL 2014	Complete capital upgrades if granted extension	If your water system must make capital upgrades in order to comply with the Stage 2 DBPR MCLs, you can request a 2-year extension to complete the upgrades.	

TABLE C-2
STAGE 2 DBPR REQUIREMENTS FOR
ARMY WATER SYSTEMS SERVING 50,000 – 99,999 OR BELONG TO A COMBINED DISTRIBUTION SYSTEM IN WHICH THE LARGEST SYSTEM SERVES 50,000 – 99,999

COMPLIANCE DEADLINE	STAGE 2 DBPR REQUIREMENT	NOTES	GUIDANCE MATERIALS
1 APRIL 2007	Submit your IDSE Plan	-Decide on pursuing the SM or SSS IDSE option. -Develop and submit your IDSE plan for review. Include minimum submission requirements.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Wizard -EPA IDSE Guidance Manual -EPA Consecutive System Stage 2 Guidance Manual
1 APRIL 2008	State (or EPA) must complete review of your ISDE Plan	The primacy agent has up to 1 year to review your plan. You may be notified of approval or modifications before the deadline.	
31 MARCH 2009	Complete your IDSE	You must complete the conduct of your IDSE plan by this date to allow time to develop the IDSE final report.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Guidance Manual -EPA Consecutive System Stage 2 Guidance Manual
1 JULY 2009	Submit your IDSE Final Report	Include minimum submission requirements.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Guidance Manual -EPA Consecutive System Stage 2 Guidance Manual
1 OCTOBER 2012	1) Begin Stage 2 DBPR Compliance Monitoring 2) Complete treatment upgrades if necessary to comply with Stage 2 DBPR MCLs	Your water system must begin monitoring at the sites identified in the IDSE for compliance with the Stage 2 DBPR MCLs.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA Simultaneous Compliance Manual for the Stage 2 DBPR and LT2ESWTR -EPA Consecutive System Stage 2 Guidance Manual -EPA Operational Evaluation Guidance Manual
1 OCTOBER 2014	Complete capital upgrades if granted extension	If your water system must make capital upgrades in order to comply with the Stage 2 DBPR MCLs, you can request a 2-year extension to complete the upgrades.	

TABLE C-3
STAGE 2 DBPR REQUIREMENTS FOR
ARMY WATER SYSTEMS SERVING 10,000 – 49,999 OR BELONG TO A COMBINED DISTRIBUTION SYSTEM IN WHICH THE LARGEST SYSTEM SERVES 10,000 – 49,999

COMPLIANCE DEADLINE	STAGE 2 DBPR REQUIREMENT	NOTES	GUIDANCE MATERIALS
1 OCTOBER 2007	Submit your IDSE Plan	-Decide on pursuing the SM or SSS IDSE option. -Develop and submit your IDSE plan for review. Include minimum submission requirements.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Wizard -EPA IDSE Guidance Manual -EPA Consecutive System Stage 2 Guidance Manual
1 OCTOBER 2008	State (or EPA) must complete review of your ISDE Plan	The primacy agent has up to 1 year to review your plan. You may be notified of approval or modifications before the deadline.	
30 SEPTEMBER 2009	Complete your IDSE	You must complete the conduct of your IDSE plan by this date to allow time to develop the IDSE final report.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Guidance Manual -EPA Consecutive System Stage 2 Guidance Manual
1 JANUARY 2010	Submit your IDSE Final Report	Include minimum submission requirements.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Guidance Manual -EPA Consecutive System Stage 2 Guidance Manual
1 OCTOBER 2013	1) Begin Stage 2 DBPR Compliance Monitoring 2) Complete treatment upgrades if necessary to comply with Stage 2 DBPR MCLs	Your water system must begin monitoring at the sites identified in the IDSE for compliance with the Stage 2 DBPR MCLs.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA Simultaneous Compliance Manual for the Stage 2 DBPR and LT2ESWTR -EPA Consecutive System Stage 2 Guidance Manual -EPA Operational Evaluation Guidance Manual
1 OCTOBER 2015	Complete capital upgrades if granted extension	If your water system must make capital upgrades in order to comply with the Stage 2 DBPR MCLs, you can request a 2-year extension to complete the upgrades.	

TABLE C-4
STAGE 2 DBPR REQUIREMENTS FOR
ARMY COMMUNITY WATER SYSTEMS SERVING LESS THAN 10,000 OR BELONG TO A COMBINED DISTRIBUTION SYSTEM IN WHICH THE LARGEST SYSTEM SERVES LESS THAN 10,000

COMPLIANCE DEADLINE	STAGE 2 DBPR REQUIREMENT	NOTES	GUIDANCE MATERIALS
1 APRIL 2008	Submit your IDSE Plan	-Decide on pursuing the SM or SSS IDSE option. -Develop and submit your IDSE plan for review. Include minimum submission requirements.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Wizard -EPA IDSE Guide for Systems Serving < 10,000 -EPA Consecutive System Stage 2 Guidance Manual -EPA Small System Guidance Manual for the Stage 2 DBPR
1 APRIL 2009	State (or EPA) must complete review of your ISDE Plan	The primacy agent has up to 1 year to review your plan. You may be notified of approval or modifications before the deadline.	
31 MARCH 2010	Complete your IDSE	You must complete the conduct of your IDSE plan by this date to allow time to develop the IDSE final report.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Guide for Systems Serving < 10,000 -EPA Consecutive System Stage 2 Guidance Manual -EPA Small System Guidance Manual for the Stage 2 DBPR
1 JULY 2010	Submit your IDSE Final Report	Include minimum submission requirements.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA IDSE Guide for Systems Serving < 10,000 -EPA Consecutive System Stage 2 Guidance Manual -EPA Small System Guidance Manual for the Stage 2 DBPR
1 OCTOBER 2013	1) Begin Stage 2 DBPR Compliance Monitoring 2) Complete treatment upgrades if necessary to comply with Stage 2 DBPR MCLs	Your water system must begin monitoring at the sites identified in the IDSE for compliance with the Stage 2 DBPR MCLs.	http://www.epa.gov/safewater/disinfection/stage2/compliance.html: -EPA Simultaneous Compliance Manual for the Stage 2 DBPR and LT2ESWTR -EPA Consecutive System Stage 2 Guidance Manual -EPA Operational Evaluation Guidance Manual -EPA Small System Guidance Manual for the Stage 2 DBPR
1 OCTOBER 2015	Complete capital upgrades if granted extension	If your water system must make capital upgrades in order to comply with the Stage 2 DBPR MCLs, you can request a 2-year extension to complete the upgrades.	

APPENDIX D
STAGE 2 DBPR STATE POC LIST

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Stage 2 Contact List

Region	State	Stage 2 Contact	Telephone Number	Email Address
Region	**State**			
1	CT	Christopher Roy	860-509-7333	christopher.roy@po.state.ct.us
	ME	Jennifer Hitchcock	207-287-3962	jennifer.hitchcock@maine.gov
	NH	Robert Mann	603-271-2953	rmann@des.state.nh.us
		Cynthia Klevens	603-271-3108	cklevens@des.state.nh.us
	MA	Adrienne Harris	617-918-1518	harris.adrienne@epa.gov
		Kevin Reilly	617-918-1694	reilly.kevin@epa.gov
	RI	Susan Rabideau	401-222-7784	Susan.Rabideau@health.ri.gov
		Doris Aschman	401-222-7786	Doris.Aschman@health.ri.gov
	VT	Ellen Parr Doering	802-241-3410	Ellen.ParrDoering@state.vt.us
		Jeannine McCrumb	802-241-3400	Jeannine.McCrumb@state.vt.us
Region	**State**			
2	NJ	Felicia Fieo	609-292-5550	Felicia.Fieo@dep.state.nj.us
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	PR	Olga Rivera	787-777-0150	orivera@salud.gov.pr
	VI	HQ		stage2mdbp@epa.gov
Region	**State**			
3	DC	Jason Gambatese	215-814-5759	gambatese.jason@epa.gov
	DE	Ed Hallock	302-741-8590	Edward.Hallock@state.de.us
	MD	Nancy Reilman	410-537-3710	nreilman@mde.state.md.us
	PA	Jason Gambatese	215-814-5759	gambatese.jason@epa.gov
	WV	Charles Robinette	304-558-6714	crobinette@wvdhhr.org
	VA	Steve Pellei	804-864-7489	Steve.Pellei@vdh.virginia.gov
Region	**State**			
	AL		334-271-7773	h2omail@adem.state.al.us
	FL	Robert Burns		burns.robert@epa.gov
		Amy Newbold		newbold.amy@epa.gov
	GA	Onder Serefli		onder_serefli@dnr.state.ga.us
	KY	Julie Roney		julie.roney@ky.gov
	MS	Melissa Parker		mparker@msdh.state.ms.us
	NC	Julia Cavalier		julia.cavalier@ncmail.net
	SC	Richard Welch		welchra@dhec.sc.gov
	TN	Robert Foster		robert.foster@tdec.state.tn.gov
Region	**State**	*NOTE: For Region 5 HQ is the POC for the following mega-systems and the CDSs: Chicago, Detroit, Indianapolis, Cincinnati, Columbus, Cleveland, and Milwaukee For all other States (except Minnesota) the POCSs are Miguel Del Toral and Ronald Kovach.		
5	IL	*Mega-systems and CDSs: HQ		stage2mdbp@epa.gov
		Miguel Del Toral	312-886-5253	deltoral.miguel@epa.gov
		Ronald Kovach	312-886-1441	kovach.ronaldd@epa.gov

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Region	**State**			
6	AR	Lyle Godfrey	501-661-2655	
	LA	Caryn Benjamin	225-765-5052	Cbenjami@dhh.la.gov
	NM	Chuck Thomas	505-222-9532	charles.thomas@state.nm.us
	OK	Nancy Ho	214-665-3179	ho.nancy@epa.gov
	TX	Alicia Diehl	512-239-1626	adiehl@tceq.state.tx.us
Region	**State**			
7	IA	Roy Ney	515-725-0360	roy.ney@dnr.state.ia.us
		Diane Moles	515-725-0281	diane.moles@dnr.state.ia.us
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	NE	Elizabeth Esseks	402-471-1010	elizabeth.esseks@hhss.ne.gov
		Mary Poe	402-471-1003	mary.poe@hhss.ne.gov
Region	**State**			
8	CO	Sean Lieske	303-692 3505	
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	ND	Brian Blotsky	701-328-5221	bblotsky@state.nd.us
	SD	Mark S. Mayer	605-773-6039	mark.mayer@state.sd.us
	UT	Mike Johanson	801-536-4200	mjohanson@utah.gov
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	WY	HQ		stage2mdbp@epa.gov
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Region	**State**			
9	AZ	Donna Lucchese	602-771-4641	dml@azdeq.gov
		Starr Abounader	602-771-4626	sa2@azdeq.gov
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	NV	Andrea Seifert	775-687-9520	
		Ross Cooper	775-687-9520	
	GU	Barry Pollock	415-972-3563	pollock.barry@epa.gov

		Angel Marquez	671-475-1638	Angel.Marquez@Guamepa.net
	AS	Su Cox	415-972-3555	cox.susan@epa.gov
		Edna Buchan	684-633-2304	ebuchan2@yahoo.com
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APPENDIX E
EPA STAGE 2 DBPR FACT SHEET

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Fact Sheet: Stage 2 Disinfectants and Disinfection Byproducts Rule

In the past 30 years, the Safe Drinking Water Act (SDWA) has been highly effective in protecting public health and has also evolved to respond to new and emerging threats to safe drinking water. Disinfection of drinking water is one of the major public health advances in the 20th century. One hundred years ago, typhoid and cholera epidemics were common through American cities; disinfection was a major factor in reducing these epidemics.

However, the disinfectants themselves can react with naturally-occurring materials in the water to form byproducts, which may pose health risks. In addition, in the past 10 years, we have learned that there are specific microbial pathogens, such as *Cryptosporidium*, which can cause illness, and are highly resistant to traditional disinfection practices.

Amendments to the SDWA in 1996 require EPA to develop rules to balance the risks between microbial pathogens and disinfection byproducts (DBPs). The Stage 1 Disinfectants and Disinfection Byproducts Rule and Interim Enhanced Surface Water Treatment Rule, promulgated in December 1998, were the first phase in a rulemaking strategy required by Congress as part of the 1996 Amendments to the Safe Drinking Water Act.

The Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) builds upon the Stage 1 DBPR to address higher risk public water systems for protection measures beyond those required for existing regulations.

The Stage 2 DBPR and the Long Term 2 Enhanced Surface Water Treatment Rule are the second phase of rules required by Congress. These rules strengthen protection against microbial contaminants, especially *Cryptosporidium*, and at the same time, reduce potential health risks of DBPs.

Questions and Answers

What is the Stage 2 DBPR?

The Stage 2 Disinfection Byproducts Rule will reduce potential cancer and reproductive and developmental health risks from disinfection byproducts (DBPs) in drinking water, which form when disinfectants are used to control microbial pathogens. Over 260 million individuals are exposed to DBPs.

This final rule strengthens public health protection for customers by tightening compliance monitoring requirements for two groups of DBPs, trihalomethanes (TTHM) and haloacetic acids (HAA5). The rule targets systems with the greatest risk and builds incrementally on existing rules. This regulation will reduce DBP exposure and related potential health risks and provide more equitable public health protection.

The Stage 2 DBPR is being promulgated simultaneously with the Long Term 2 Enhanced Surface Water Treatment Rule to address concerns about risk tradeoffs between pathogens and DBPs.

What does the rule require?

Under the Stage 2 DBPR, systems will conduct an evaluation of their distribution systems, known as an Initial Distribution System Evaluation (IDSE), to identify the locations with high disinfection byproduct concentrations. These locations will then be used by the systems as the sampling sites for Stage 2 DBPR compliance monitoring.

Compliance with the maximum contaminant levels for two groups of disinfection byproducts (TTHM and HAA5) will be calculated for each monitoring location in the distribution system. This approach, referred to as the locational running annual average (LRAA), differs from current requirements, which determine compliance by calculating the running annual average of samples from all monitoring locations across the system.

The Stage 2 DBPR also requires each system to determine if they have exceeded an operational evaluation level, which is identified using their compliance monitoring results. The operational evaluation level provides an early warning of possible future MCL violations, which allows the system to take proactive steps to remain in compliance. A system that exceeds an operational evaluation level is required to review their operational practices and submit a report to their state that identifies actions that may be taken to mitigate future high DBP levels, particularly those that may jeopardize their compliance with the DBP MCLs.

Who must comply with the rule?

Entities potentially regulated by the Stage 2 DBPR are community and nontransient noncommunity water systems that produce and/or deliver water that is treated with a primary or residual disinfectant other than ultraviolet light.

A community water system (CWS) is a public water system that serves year-round residents of a community, subdivision, or mobile home park that has at least 15 service connections or an average of at least 25 residents.

A nontransient noncommunity water system (NTNCWS) is a water system that serves at least 25 of the same people more than six months of the year, but not as primary residence, such as schools, businesses, and day care facilities.

What are disinfection byproducts (DBPs)?

Disinfectants are an essential element of drinking water treatment because of the barrier they provide against waterborne disease-causing microorganisms. Disinfection byproducts (DBPs) form when disinfectants used to treat drinking water react with naturally occurring materials in the water (e.g., decomposing plant material).

Total trihalomethanes (TTHM - chloroform, bromoform, bromodichloromethane, and dibromochloromethane) and haloacetic acids (HAA5 - monochloro-, dichloro-, trichloro-, monobromo-, dibromo-) are widely occurring classes of DBPs formed during disinfection with chlorine and chloramine. The amount of trihalomethanes and haloacetic acids in drinking water can change from day to day, depending on the season, water temperature, amount of disinfectant added, the amount of plant material in the water, and a variety of other factors.

Are THMs and HAAs the only disinfection byproducts?

No. The four THMs (TTHM) and five HAAs (HAA5) measured and regulated in the Stage 2 DBPR act as indicators for DBP occurrence. There are many other known DBPs, in addition to the possibility of unidentified DBPs present in disinfected water. THMs and HAAs typically occur at higher levels than other known and unknown DBPs. The presence of TTHM and HAA5 is representative of the occurrence of many other chlorination DBPs; thus, a reduction in the TTHM and HAA5 generally indicates a reduction of DBPs from chlorination.

What are the costs and benefits of the rule?

Quantified benefits estimates for the Stage 2 DBPR are based on reductions in fatal and non-fatal bladder cancer cases. EPA has projected that the rule will prevent approximately 280 bladder cancer cases per year. Of these cases, 26% are estimated to be fatal. Based on bladder cancer alone, the rule is estimated to provide annualized monetized benefit of $763 million to $1.5 billion.

The rule applies to approximately 75,000 systems; a small subset of these (about 4%) will be required to make treatment changes. The mean cost of the rule is $79 million annually. Annual household cost increases in the subset of plants adding treatment are estimated at an average of $5.53, with 95 percent paying less than $22.40.

What are the compliance deadlines?

Compliance deadlines are based on the sizes of the public water systems (PWSs). Wholesale and consecutive systems of any size must comply with the requirements of the Stage 2 DBPR on the same schedule as required for the largest system in the combined distribution system (defined as the interconnected distribution system consisting of wholesale systems and consecutive systems that receive finished water). Compliance activities are outlined in the following table.

PUBLIC WATER SYSTEMS	ACTIONS			
	Submit IDSE monitoring plan, system specific study plan, or 40/30 certification	**Complete an initial distribution system evaluation (IDSE)**	**Submit IDSE Report**	**Begin subpart V (Stage 2) compliance monitoring**
CWSs and NTNCWSs serving at least 100,000	October 1, 2006	September 30, 2008	January 1, 2009	April 1, 2012
CWSs and NTNCWSs serving 50,000 - 99,999	April 1, 2007	March 31, 2009	July 1, 2009	October 1, 2012
CWSs and NTNCWSs serving 10,000 - 49,999	October 1, 2007	September 30, 2009	January 1, 2010	October 1, 2013
CWSs serving fewer than 10,000	April 1, 2008	March 31, 2010	July 1, 2010	October 1, 2013
NTNCWSs serving fewer than 10,000	NA	NA	NA	October 1, 2013

*States may grant up to an additional two years for systems making capital improvements.

What technical information will be available on the rule?

The following Guidance Documents will be available:

- Initial Distribution System Evaluation (IDSE) Guidance Manual
- Operational Evaluation Guidance Manual
- Consecutive Systems Guidance Manual
- Small Systems (SBREFA) Guidance Manual
- Simultaneous Compliance Guidance Manual

Where can I find more information about this notice and the Stage 2 DBPR?

For general information on the rule, please visit the EPA Safewater website at http://www.epa.gov/safewater/disinfection/stage2 or contact the Safe Drinking Water Hotline at 1-800-426-4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding legal holidays, from 10:00 a.m. to 4:00 p.m., Eastern Time. For technical inquiries, email stage2mdbp@epa.gov .

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